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INCIPIENT HYPOTHYROIDISM

A CLINICAL STUDY *

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The thyroid gland is the best understood member of the endocrine system, and, on account of its accessibility for extirpation experiments and other observations, its functions are fairly well established. The greater part of the literature on the thyroid deals with clinical entities resulting from an overactive gland, and it has been only in comparatively recent years that its underactive potentialities have been given serious consideration.

In 1874, Gull published his classic monograph, "On a Cretinoid State Supervening in the Adult Life of Women." Eleven years later, Schiff successfully transplanted the thyroid gland into the abdominal wall and initiated the treatment of thyroid insufficiency by feeding the desiccated glands.

In 1895, Magnus-Levy [1] demonstrated the ability of thyroid preparations to raise the rate of both oxygen and carbon dioxid exchange through the lungs, and in 1904, he [2] pointed out the principles of interrelationship between thyroid activity and basal metabolism.

It is now generally recognized that a reduction in the basal metabolism is the most constant single evidence of hypothyroidism. This statement is made with due respect to other glands which under certain conditions may lower the metabolism. The gonads may be included in this group. Rovinski [3] has shown that the fall of metabolism following castration largely disappeared if the thyroid was first removed, and he concluded that the lowered metabolism was due to a depression of the thyroid rather than directly to absence of the gonads. The influence exerted by the anterior lobe of the pituitary gland is similar to that of the gonads, and it is possible that it is accomplished also through the thyroid. The fourth organ that regulates metabolism is the suprarenal. Recent studies have shown that removal of the suprarenal glands from cats definitely lowered their rate of metabolism. In a few cases of Addison's disease reported with metabolic studies, evidences of a reduced metabolism have been demonstrated.

Exhaustive studies on patients showing marked depression of their metabolic rates have been made from time to time by Plummer,[4] Means,[5] Sturgis,[6] and others,[7] all of whom found a close parallelism between physical signs and the percentage of metabolism.

This report deals with another group of cases in which the metabolic rates were sufficiently near the borderline to make the diagnosis of hypothyroidism doubtful, unless substantiated by other evidence. Twenty-three cases have been selected from the records at St. Elizabeth's Hospital,[8] whose metabolic readings ranged from —11 to —25. A probable diagnosis of incipient hypothyroidism was based on an analysis of the histories, physical findings and basal metabolisms, and was further strengthened by the beneficial effect following the administration of thyroid extract or thyroxin.

The object of the report is to emphasize certain so-called clinical syndromes which are not commonly found in the true myxedema types. In the majority of instances, symptoms referable to other pathologic conditions constituted the chief complaint.

RESULTS OF OBSERVATIONS

Sex.—The entire series consisted of female patients, as no metabolic studies were carried out on men.

Age.—The ages by decades were: from 1 to 10, one case; from 10 to 20, two cases; from 20 to 30, four cases; from 30 to 40, five cases; from 40 to 50, eight cases; from 50 to 60, two cases, and from 60 to 70, one case. It will be seen that more than half the patients were between the ages of 30 and 50, particularly at or following the menopause.

Level of Basal Metabolism.—The level of the basal metabolism in this series varied from —11 to —25. Low readings are generally associated with one or more of the unmistakable evidences of myxedema and very seldom occasion any difficulty in diagnosis. Sturgis, however, has reported the case of a physician who showed a metabolism of more than 20 per cent. below the normal and was entirely free of symptoms. In my experience, some patients with a low reading have shown fewer signs of a thyroid deficiency than others whose rate was considerably less markedly low.

From a diagnostic standpoint, the most important group for study is that in which the metabolism of the patients falls between —10 and —20. As a rule, evi-

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* Read before the Section on Practice of Medicine at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Magnus-Levy, A.: Ueber den respiratorischen Gaswechsel unter dem Einfluss der Thyreoidea, Berl. klin. Wchnschr. **32**: 650, 1895.

2. Magnus-Levy, A.: Ueber Myxodem, Ztschr. f. klin. Med. **52**: 201, 1904.

3. Rovinski, M. I.: The Influence of Thyroidectomy and Castration upon the Gaseous and Nitrogenous Interchange of Substances in Animals (Russian), Dissertation, Petrograd, 1913.

4. Plummer, H. S.: Interrelationship of Function of the Thyroid Gland and of Its Active Agent, Thyroxin, in the Tissues of the Body, J. A. M. A. **77**: 243 (July 25) 1921.

5. Means, J. H.: The Basal Metabolism in Obesity, Arch. Int. Med. **17**: 704 (May) 1916.

6. Sturgis, C. C.: A Clinical Study of Myxedema with Observations of the Basal Metabolism, M. Clin. N. Am. **5**: 1251 (March) 1922.

7. Boothby, W. M., and Sandiford, Irene: Calorigenic Effect of Adrenalin in Dogs, Am. J. Physiol. **59**: 463, 1922. King, J. T., Jr.: Hypothyroidism, South. M. J. **17**: 662 (Sept.) 1924. Emery, E. S., Jr.: Blood in Myxedema, Am. J. M. Sc. **165**: 577-583 (April) 1923.

8. All determinations of the basal metabolism were made with the Benedict-Collins apparatus at St. Elizabeth's Hospital, under conditions as nearly ideal as possible. All tests were made in the early morning, after the patients had abstained from food or drink since the previous evening meal, and had rested in bed from one-half to one hour preceding the determinations.

dences of a true myxedema are lacking, and there may be an actual hyperirritability. While the skin is often suggestive, the pulse may be accelerated, and loss of weight is not uncommon. In fact, the clinical picture of the mild hypo-active state may not differ very materially from the early hyperactive syndrome.

Relation of Pulse Rate to Basal Metabolism.—Contrary to the usual conception of the hypothyroid patient, the pulse rate in our series was below 70 in only a few instances, and in some there was a definite increase above the normal rate. The pulse record was obtained during the metabolism test when complete relaxation was emphasized. At other times, there was often a definite tachycardia wholly out of keeping with the usual picture of an underactive gland. A probable explanation of this apparent deviation from the tendency to bradycardia is not difficult to surmise. While the pulse rate in true uncomplicated myxedema is relatively slow, the milder grades of thyroid deficiency are generally associated with other pathologic conditions which naturally may alter the pulse rate as well as the entire clinical picture. An accelerated pulse may therefore exist in spite of a definite hypothyroidism. In the more advanced type of myxedema, the degenerative changes in the heart muscle usually account for the presence of a rapid pulse. I was unable to establish any true relationship between the pulse pressure and metabolic readings in this series by the use of Read's [9] correlation coefficient.

TABLE 1.—*Incidence of Clinical Conditions Associated with Lowered Metabolism, in Order of Frequency*

Clinical Conditions:	Times
Colloid goiter	7
Ovarian disease or removal	4
Menopause	3
Obesity	3
Hysterectomy	2
Pituitary disease	1
Tetany	1
Cholelithiasis	1
Duodenal ulcer	1

Associated Clinical Conditions.—The chief clinical diseases that were associated with the group showing a lowered metabolism are listed in their order of frequency in Table 1.

Colloid goiter ranks first in the series, occurring in seven of the twenty-three cases. Although Plummer states that the basal metabolism in colloid goiter is usually between — 8 and — 15 per cent., one of this group had a basal reading of — 25.

Diseases of the generative organs and the menopause came next in frequency. In fact, the combined number of this type exceeded the incidence of goiter as an associated clinical condition. Experimental evidence seems to support the impression that castration tends to lower the metabolism. Aub,[10] for instance, favors this view on the assumption that the metabolism is lowered following the removal of the gonads, probably through depression of thyroid activity. Other studies, however, have failed to establish this relationship, although the subject has apparently not received the attention it deserves. The fact that many women show a tendency toward obesity after the menopause may be considered as evidence of a lowered metabolism, but there is no definite proof of such a decrease. The frequent onset of hypothyroidism at or during the menopause also suggests a relation between the ovaries and the thyroid gland.

The fact that more than one half of these patients were actually below their normal weight, according to the American actuarial standards, indicates that obesity is not necessarily a symptom of hypothyroidism. In Table 2, the relation of the age-weight to the metabolic readings is given. Only three cases can be credited with an excessive amount of adipose tissue. As pointed out by Means, obesity is not an indication of thyroid insufficiency, but may, in fact, show a moderate increase in the metabolic rate. It is not uncommon to find a lowered metabolism in an undernourished person who may actually gain weight under thyroid therapy.

Significant Signs and Symptoms.—In the well marked types of true myxedema, the signs and symptoms are generally so constant and typical that little variation is found. In the milder forms, however, a different syndrome presents itself which bears only a slight similarity to the fully developed types (Table 3). Dryness of the skin and dryness of the hair are common to both, but to a much milder degree in the incipient cases. In the present series, these signs were present thirteen and ten times, respectively. A premature wrinkling of the forehead, which may have some diagnostic bearing, was observed in a number of cases.

Nervousness of a local or general nature was one of the most frequent complaints. In some, it was a sensation of tingling in the extremities, or perhaps a sense of constriction about the head; in others, there were periods of depression, emotionalism or other evidences of a neurosis. As these clinical manifestations are so commonly indicative of a hyperactive gland, they are not generally sought for in the hypothyroid states.

Fourteen out of twenty-three histories emphasized vague unclassifiable pains as a prominent factor in the illness. This symptom was frequently referable to the abdomen, and was often the source of considerable annoyance in the diagnosis. It was generally inconstant, was neuralgic in type, and varied in intensity from day to day. The fact that the pain bore no definite relation to any particular organ or nerve distribution was its most characteristic feature.

TABLE 2.—*A Comparison of the Height and Weight According to Age, Showing Thirteen of the Twenty-Three Patients Below the Normal Standards*

No.	Age	Hgt. In.	Wgt. Lbs.	Pounds +	Pounds —	B.M.	No.	Age	Hgt. In.	Wgt. Lbs.	Pounds +	Pounds —	B.M.
1	47	69	90	..	73	—13	13	39	60	120	..	6	—18
2	45	67	152	..	1	—16	14	64	64	110	..	34	—11
3	34	63	116	..	14	—16	15	49	64	107	..	36	—20
4	43	67	143	..	9	—18	16	27	68	112	..	32	—17
5	46	65	186	40	..	—25	17	34	68	180	30	..	—25
6	16	65	160	36	..	—23	18	55	67	180	22	..	—16
7	9	50	80	23	..	—25	19	40	62	110	..	22	—22
8	26	66	135	4	..	—19	20	59	62	127	..	11	—24
9	16	62	124	10	..	—22	21	38	64	195	58	..	—16
10	44	67	133	..	20	—18	22	26	69	192	44	..	—16
11	38	64	85	..	52	—12	23	24	66	130	..	4	—11
12	48	67	160	4	..	—16							

Constipation and Headache.—These were complained of by thirteen and five, respectively, of the twenty-three patients. Although these symptoms are common in the true myxedemas, they probably are no more frequent in the incipient cases than they usually are in other conditions.

Localized Edema.—This was observed in seven patients, the lowest metabolism in this group being — 16. According to Plummer, edema generally

9. Read, J. M.: Basal Pulse Rate and Pulse Pressure Changes Accompanying Variations in Basal Metabolic Rate, Arch. Int. Med. **34**: 553-565 (Oct.) 1924.

10. Aub, J. C.: The Relation of the Internal Secretions to Metabolism, J. A. M. A. **79**: 95 (July 8) 1922.

decreases when the metabolic reading is about — 18 and increases as the depression becomes more marked. The swelling was of the myxedematous type in only one patient. In the remaining six, there was slight pitting of the ankles, a sense of tightness in the fingers, and a moderate fulness of the eyelids.

The absence of certain myxedematous signs was rather striking. In no instance was there any evidence of circulatory changes as shown by arteriosclerosis, vascular hypertension, cardiac abnormalities or renal complications. The patellar reflexes showed no demonstrable delayed response, as pointed out by Chaney,[11] in the more advanced types of hypothyroidism. Anemia was not a complicating factor, and there was no relative change in the differential count of the white cells.

TABLE 3.—*Major Signs and Symptoms Accompanying the Lowered Basal Metabolism, in Order of Their Frequency*

	Times
Dryness of skin	13
Dry or thin hair	10
Nervous (local and general)	17
Indefinite pains	14
Constipation	13
Localized edema	7
Headaches	5

GENERAL IMPRESSIONS

It is obvious that no definite conclusions can be drawn from this limited series; there are, however, certain impressions that may be worthy of consideration:

1. Incipient hypothyroidism is represented by a clinical syndrome largely distinctive from true myxedema.

2. In addition to a moderate degree of dryness of the hair and skin, neuroses, of various types, and vague unclassifiable pains constitute the most frequent complaints.

3. Obesity is relatively uncommon, and actual underweight is not infrequently found in the mild hypothyroid states.

4. Incipient hypothyroidism is more frequently found near the menopause and apparently bears some relation to the activity of the ovaries.

Medical Arts Building.

11. Chaney, W. C.: Tendon Reflexes in Myxedema: A Valuable Aid in Diagnosis, J. A. M. A. **82**: 2013-2016 (June 21) 1924.

Prevention of Interstate Spread of Disease.—Under the quarantine act of Feb. 15, 1893, the Secretary of the Treasury is authorized to issue regulations for the prevention of the spread of contagious and infectious diseases from one state to another. These regulations may be enforced by the states, but the Public Health Service is authorized to cooperate in their enforcement, not only to prevent the spread of diseases, but to promote health. This is the means invariably taken. The wisdom of such a policy is shown by the substantial growth of state health agencies, the cordial spirit of cooperation that prevails, and the substantial advance made. Examples of work of this character that may be mentioned are cooperative work in rural sanitation, and the examination of rodents to prevent plague and examination of water supplies used on vessels and trains engaged in interstate traffic. There are great possibilities of extending such work, and it is along these lines that work of the Public Health Service will advance. The limitations of existing federal laws in this respect may be determined only by future judicial interpretation.—Kerr, J. W.: *Pub. Health Rep.* **40**:1680 (Aug. 14) 1925.

EXOPHTHALMIC GOITER (GRAVES' SYNDROME) AND INVOLUNTARY NERVOUS SYSTEM

XII. PATHOGENESIS *

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The abstract discussion of the pathogenesis of exophthalmic goiter may serve a threefold purpose—the interpretation of known data, the suggestion of avenues of approach for future study, and the development of a rational therapeutic regimen.

As we have previously shown,[1] the symptoms of exophthalmic goiter are identical with those which may be produced in any individual by effective doses of a sympathomimetic substance. We are still convinced that the participation of the involuntary nervous system is an important element in the evolution of exophthalmic goiter. Accordingly, a discussion of the pathogenesis of exophthalmic goiter necessitates a preliminary inquiry into the factors that may control the involuntary nervous system in health and disease.

The involuntary nervous system may produce the manifestations of exophthalmic goiter through the intervention of some unknown circulating sympathomimetic substance or substances. Thus far, attempts to demonstrate such a substance in effectual concentration in the circulating fluids have proved futile. Again, the sympathomimetic symptoms may be produced by a loss of some restraining influence (parathyroid,[2] suprarenal cortex [3]) but this work is as yet too recent for adequate discussion. There is indicated an inquiry into the better established facts with regard to the involuntary nervous system.

The involuntary nervous system supplies with a dual and reciprocal innervation [4] practically all glandular tissue and smooth and cardiac muscle. Disturbances of the involuntary nervous system may, in consequence, assume an infinite variety of clinical manifestations—changes in the caliber of the bronchi and peripheral blood vessels, modifications of every conceivable type in the secretory and motor activity of the stomach, intestines and sweat glands, and every known alteration of rhythmicity, conductivity and irritability of heart muscle. Such changes may occur singly or in combinations of any variety. The occurrence of any such disturbance in function results in the production of symptoms through the entrance into consciousness of the activities of the involuntary nervous system. These symptoms lead the patient to the physician. The symptoms often point to one organ which, on careful examination, proves sound and free of demonstrable organic disease, and it is then that there arises the suspicion that the basis of the disturbed function is an alteration in the innervation. These conditions are usually diagnosed as visceral "neuroses," but should be regarded, in our opinion,

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* Read before the Section on Practice of Medicine at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Lieb, C. C.; Hyman, H. T., and Kessel, Leo: A Study of Exophthalmic Goiter and the Involuntary Nervous System, J. A. M. A. **79**: 1099 (Sept. 30) 1922.

2. Collip: J. Pharmacol. & Exper. Therap. **25**: 2 (March) 1925.

3. Marine, Baumann and Cipra: Am. J. Physiol. **72**: 248 (April) 1925.

4. Gaskell: The Involuntary Nervous System, New York, Longmans, Green & Co., 1916.

as local manifestations of widespread disturbances in the involuntary nervous system; i. e., autonomic imbalance.[5]

Autonomic imbalance is characterized by widespread and diverse clinical manifestations of instability of the involuntary nervous system, and by absence of demonstrable organic disease, and it runs a course punctuated by remissions and exacerbations. As a general rule, the patients suffer no severe inroads on their general health and form the large group of sufferers, the majority of whom are neither ill nor well, who wander from pillar to post and fall easy prey to the current charlatan. Of the myriad manifestations of autonomic imbalance, exophthalmic goiter is by far the most severe, the most complicated and the most debilitating. Any discussion of the pathogenesis of exophthalmic goiter presupposes an understanding of autonomic imbalance and its dependence, in turn, on disturbances of the involuntary nervous system.

We have not yet identified the factors that may regulate the tonicity of the involuntary nervous system in health, in emergency and in disease. To the endocrinologist, the involuntary nervous system is intimately concerned with the hormones; together they constitute a self-regulatory mechanism, a beneficent cycle in which the hormones regulate the activity of the involuntary nervous system; and the involuntary nervous system, in its turn, modifies the secretions of the glands. However, the very converse seems to be true, for the involuntary nervous system may function normally in the absence of the ductless glands,[6] and the ductless glands may continue to function after they have been deprived of their innervation. For the present, we may consider that the independence of the involuntary nervous system and the ductless glands has been established and that the inclusion in the realm of endocrinology of autonomic imbalance sets up a false hypothesis and suggests a useless therapeutic procedure.

The involuntary nervous system may be either stable or unstable. The instability may be either congenital or acquired, and it seems to increase in direct proportion to the advance of civilization. In each individual with autonomic imbalance, there is a characteristic manifestation of the instability which constitutes the "reaction picture." We do not know what determines the inheritance of the type of the "reaction picture," but, once established, this "reaction picture" is relatively fixed for that individual and may be evoked pharmacodynamically by the investigator. It is often quiescent (potential autonomic imbalance), but it may be activated in many ways. In the clinic, the most frequently observed activating agents are infection and psychic trauma. The sympathomimetic symptoms in early tuberculosis exemplify the activation by infection. More important, however, is the activation by psychic disturbances and emotional stress. Indeed, in almost every instance, irrespective of the original activating cause, the psychic factor eventually operates; for the visceral symptoms of the autonomic imbalance give rise to anxiety, and the "fear of illness" imposes on the "reaction picture" another activating agent (psychic trauma). A correct diagnosis may be, therefore, a potent psychotherapeutic agent. It may serve, prophylactically, to prevent the production of the cyclic reactivation of the symptoms, or it may serve to minimize the existing imbalance by removing the fear of organic disease. On the other hand, an incorrect diagnosis or a failure to recognize the mechanism of the production of the "reaction picture" may serve to perpetuate the symptoms. Such patients are often temporarily benefited, for example, by a Christian science practitioner, who denies the very existence of the symptom or by any therapeutist who will (like the charlatan), with the assurance of the ignorant, promise a cure. Many of the "cures" of organic disease announced by the various sects are, in truth, temporary remissions of an autonomic imbalance in which the "reaction picture" resembles the manifestations of an organic disease. An understanding of the pathogenesis of autonomic imbalance simplifies the therapeutic management; drug therapy plays a minor rôle and organotherapy none whatever.

Of the great number of patients with autonomic imbalance, only a small percentage develop exophthalmic goiter. Practically all patients with exophthalmic goiter give a history of a diathesis; i. e., autonomic imbalance. The transition from autonomic imbalance to exophthalmic goiter is characterized by the appearance of a metabolic change measured by an elevation of the basal metabolic rate.[7] Dependent on the elevation of the metabolic rate there develops a third group of symptoms (loss of weight, increased tachycardia, asthenia) which, in their turn, are due to the increased catabolism.

Such an increase in the energy metabolism may be produced by sympathomimetic influences, such as emotional shock or the amins of the epinephrin group or cocain. Were a sympathomimetic influence alone responsible for the metabolic change as well as the precedent imbalance, the management of exophthalmic goiter would be divisible into the care of the patient during the uncomplicated period of the imbalance (already indicated) and during the period of the metabolic upset. The latter period is, in our experience,[8] self-limited but may be curtailed through the use of iodids.[9] The tissues of the patient should be conserved (rest in bed) by proscribing any physical or psychic strain that might make extra energy demands and by furnishing exogenous fuel (high caloric diet).

However, the transition to exophthalmic goiter may involve the operation of an additional etiologic factor. The deficiency theories (parathyroid [2] and suprarenal cortex[3]) are not yet sufficiently developed to merit discussion. But the frequent hyperplasia of the thyroid gland has for many years directed attention to a possible thyrogenic origin for the disease. If the syndrome or any part of it, such as the metabolic increase, is due to a hyperthyroidism, the therapeutic policy outlined above is inadequate. However, there is no direct proof that the thyroid secretion is actually involved, for it is neither sympathomimetic [10] nor capable of sensitizing the involuntary nervous system.[11] It has a definite calorigenic capacity, however, and accordingly may be responsible for the transition from autonomic imbalance to exophthalmic goiter. In the absence of direct proof of a thyroid hypersecretion, many indirect claims have been made, the most important of which we shall now discuss.

5. Kessel and Hyman: Am. J. M. Sc. **165**: 513 (April) 1923.
6. Lieb and Hyman: Am. J. Physiol. **63**: 83 (Dec.) 1922.

7. At least plus 18 per cent. on three readings at forty-eight hour intervals.
8. Kessel, Leo; Hyman, H. T., and Landé, Herman: A Study of Fifty Consecutive Cases of Exophthalmic Goiter, Arch. Int. Med. **31**: 433 (March) 1923.
9. Starr and Means: Proc. Am. Soc. & Clin. Invest., May, 1924. Starr, Walcott, Segall and Means: Effect of Iodin in Exophthalmic Goiter, Arch. Int. Med. **34**: 355 (Sept.) 1924.
10. Lieb and Hyman: Am. J. Physiol. **63**: 88 (Dec.) 1922.
11. Lieb and Hyman: Am. J. Physiol. **63**: 60 (Dec.) 1922.

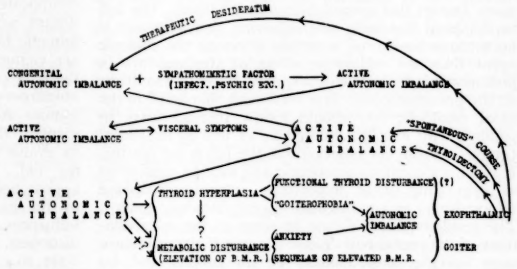
COMMENT ON INDIRECT EVIDENCE

1. *Feeding enormous quantities of thyroid extract may occasionally produce an incomplete picture of exophthalmic goiter.* Such results, however, are not brought about by doses of the extract that fall within the secretory capacity of the gland; they are further open to the objection that the results are inconstant and may partially be explained by impurities necessarily present in tissue extracts. Furthermore, at least two major symptoms—exophthalmos and hyperplasia of the thyroid gland—cannot be elicited. We have frequently injected intravenously into human beings pure thyroxin in doses comparable to a marked increase in secretory capacity. Doses of 0.005 gm. thyroxin have not, in our experience, regularly caused any symptom other than an increase in the basal metabolic rate. In normal persons this is not accompanied by the syndrome of exophthalmic goiter; in patients with true exophthalmic goiter we have caused an elevation of the energy metabolism but no definite and regular exacerbation of the symptoms of the disease. On the contrary, in the grave complication of exophthalmic goiter known as the "crisis," the intravenous injection of thyroxin [12] seems to be a distinctly beneficial, if not life-saving, procedure.

2. *Hyperplasia of the thyroid gland occurs regularly in exophthalmic goiter, and this has been interpreted as indicative of a hypersecretory state.* The hyperplasia, however, is not accompanied by any measurable increase in the output of the thyroid secretion and is caused by [13] and associated with a diminished storage of the iodin-containing hormone. The hyperplasia is, therefore, a morphologic indication, not of a secretory state but of a decrease in the storage of the hormone. In pigs, hyperplasia may be associated with a fatal myxedema ("hairless pig malady"). This exemplifies [14] the simultaneous presence of thyroid hyperplasia and an almost total suppression of thyroid function. The hyperplasia, again, may be made to revert to the colloid state by the administration of any iodin-containing substance, including thyroxin. These facts render untenable the hypothesis that hyperplasia indicates hypersecretion. We regard the theories of dysthyroidism and toxic adenomas as rhetorical substitutes for the hyperplasia-hyperthyroidism hypothesis. Until it has been demonstrated that a pathologic qualitative change may occur in gland secretion, discussion of dysthyroidism is "tilting at a windmill." No reliable data have been advanced to show that adenomas can become toxic, and this theory is opposed by the work [15] that indicates that in the same thyroid gland the nontumor tissue functions more actively than the tumor tissue. Again, adenomas are so constantly found in the hyperplastic glands of endemic goiter [16] that any theory involving their toxicity must explain away their nontoxicity in the preponderating number of instances, to say nothing of their presence in the glands of cretins in goiter belts.

3. *Myxedema admittedly due to a hyposecretion of the thyroid gland is the alleged antithesis of exophthalmic goiter.* But the analogy is far from complete. Indeed, the two conditions have in common such characteristics as the lymphocytosis, and the changes in the sugar and nitrogen metabolism.[17] Furthermore, the two conditions may coexist, as is most often seen in patients, who, after subtotal thyroidectomy, have both the residual symptoms of exophthalmic goiter and a postoperative myxedema.

4. *The relief of the symptoms of exophthalmic goiter following subtotal thyroidectomy is the most potent and important clinical indication in favor of the participation of the thyroid in the development of exophthalmic goiter.* Surgical enthusiasts claim that the operative procedure is specific and curative. Previously they waxed equally enthusiastic with reference to vessel ligation, hemithyroidectomy and partial thyroidectomy. Now all seem agreed that the truly specific procedure is subtotal thyroidectomy. If this procedure were truly specific we should expect a rapid and complete detoxification, uninterrupted convalescence and a permanent eradication of the disease. The actual facts are difficult to elicit and more difficult to interpret; for, in the first place, the technical procedure is associated with at least two homely and vital therapeutic proce-



An outline of the successive steps in the evolution of exophthalmic goiter. The effects of therapy and the therapeutic desideratum are indicated.

dures—rest and psychotherapy, to say nothing of the preliminary detoxification with iodids. We have previously reported the efficacy of rest unassociated with purposeful psychotherapy. More than 80 per cent. of our patients were economically restored on an average of three months from the date of admission to the hospital, and today, on an average of forty-six months from the admission date, 54 per cent. of the whole group are still enjoying a relatively uninterrupted and spontaneous relief from their symptoms.[18] These figures represent a minimum, and we have purposely erred on the side of a conservative interpretation of results, so that in comparing the effects of specific therapy we might not deprive any patient of any potentially beneficial therapeutic procedure. As operative procedures include a preliminary period of rest during which the patient has preparatory operations or roentgen-ray therapy in addition to iodization, and a postoperative convalescence that includes weeks and often months of rest, before the effects of the specific therapeutic procedure can be evaluated, there must be subtracted such results as may be due to the nonspecific factor of rest.

12. Kessel, Leo; and Hyman, H. T.: Exophthalmic Goiter (Graves' Syndrome) and Involuntary Nervous System, XI, Causes of Death, with Especial Reference to Pathology and Treatment by Thyroxin of "Acute Crises," J. A. M. A. **84:** 1720 (June 6) 1925.
13. Marine: Arch. Int. Med. **4:** 440 (March) 1909; **6:** 506 (April) 1910.
14. Smith: J. Biol. Chem. **33:** 313 (Feb.) 1917.
15. Graham, A.: J. Exper. Med. **24:** 345 (Oct.) 1916.
16. McCarrison: Proc. New York Path. Soc. **21:** 154, 1921.
17. Janney, N. W., and Henderson, H. E.: Concerning the Diagnosis and Treatment of Hypothyroidism, Arch. Int. Med. **26:** 297 (Sept.) 1920.
18. Kessel, Leo; and Hyman, H. T.: Studies of Exophthalmic Goiter and the Involuntary Nervous System, Arch. Surg. **8:** 149 (Jan.) 1924; Tr. Soc. Clin. Invest., to be published.

A second procedure that is included in the operative results is psychotherapy. The importance of anxiety and fear in activating autonomic imbalance is equally great in the activation and perpetuation of the symptoms of exophthalmic goiter. Our patients almost without exception give a history of psychic trauma preceding or associated with the development of the symptoms of exophthalmic goiter. In addition, almost all have a true "goiterophobia" and regard the lump in the neck as the symbol of the disease. Eradication of this symbol is not only a surgical but a psychotherapeutic procedure; for to the patient, the removal of the symbol is synonymous with the eradication of the disease. The reassurance of the surgeon, who believes that his technical procedure is a specific measure, is an added factor in the establishment of this psychotherapeutic technic.

This factor, then, makes an interpretation of operative results all the more difficult. The results following operation, moreover, are not clear cut. Usually there is an immediate and definite fall in the basal metabolic rate, a slowing of the pulse rate and a diminution of many of the manifestations of the disease. These immediate operative results are due to the ablation of thyroid tissue. But this does not necessarily mean that the procedure is truly specific. The thyroid is but one of many factors that control energy metabolism. The fall in the basal metabolic rate following thyroidectomy is no more indicative of a specific effect on the etiologic agent than the antipyretic effect of the coal-tars in pneumonia is indicative of a specific effect of the drugs on the pneumococcus. It is reasonable that a fall in the basal metabolic rate should follow thyroidectomy in patients with exophthalmic goiter as well as in normal persons. From our observations, the fall is not specific. It is, in our opinion, nonspecific and may be considered as a grafting of an imperfectly antagonistic disease (myxedema) on another disease (exophthalmic goiter). The result is a cancellation of some of the manifestations of the preexistent disease. Again if the procedure were specific, there should be no residua and no recurrences.

In our experience, as in the experience of Judd[19] at the Mayo Clinic, residua—particularly exophthalmos, tremor, asthenia and palpitation—are commonly observed, and in addition we have seen true exacerbations of exophthalmic goiter in patients who have had a sufficient ablation of thyroid tissue to give them a basal metabolic rate that was subnormal. Very often, thyroidectomy is a helpful measure and succeeds in the alleviation of many of the symptoms of the disease. If these benefits could be accomplished at no risk to the patient, the end might justify the means. But the cost of thyroidectomy is great. There is frequently associated an alarming postoperative reaction—the "crisis"—and the general mortality is between 8 and 12 per cent. There are those who report an operative mortality for subtotal thyroidectomy in true exophthalmic goiter of less than 1 per cent.[20] Such exceptional surgeons are, indeed, to be commended for their skill; but in the hands of all others to whom we have spoken, the operative mortality is increased tenfold. When this risk is considered, in discussing the management of the individual patient; when, in discussing previous experiences with subtotal thyroidectomy, the late results with residua and exacerbations are brought up; when, from the good results, are subtracted such benefits as may have been derived from rest and psychotherapy, the establishment of a definite therapeutic policy furnishes a problem of nice discrimination.

This indirect evidence tending to demonstrate the thyrogenic factor in the etiology of exophthalmic goiter is not convincing. At best, the thyroid gland is but one of perhaps many etiologic agents. Despite a great deal of careful work, the administration of its products has not regularly produced the disease, nor has its removal regularly and completely cured the disease.

The pathogenesis of exophthalmic goiter is still open to question, and the therapeutic desideratum is still to be established. In our opinion, these problems will not be solved until we can determine the sympathomimetic influences that activate the quiescent autonomic imbalance and that may, under extraordinary circumstances, superimpose on the active autonomic imbalance the metabolic upset which determines the transition to exophthalmic goiter.

SUMMARY

The discussion of the pathogenesis of exophthalmic goiter is reopened because it is as yet an unfinished problem. In our opinion, exophthalmic goiter is a complicated disease, based on a disturbance in the involuntary nervous system, activated by many sympathomimetic factors of which infection and psychic trauma are examples, and superactivated, if you will, so that there is produced a metabolic upset whose origin is obscure—which may be thyrogenic, but which probably is not. An understanding of the steps in the development of the disease may serve to facilitate the study, to evolve new therapeutic procedures and to evaluate the old. The therapeutic desideratum is not yet approached, and should strike back, not at the cause of the metabolic upset, but at the sympathomimetic influences that are at the very basis of this and allied disorders.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. HIGGINS, AND HYMAN AND KESSEL

DR. LEWELLYS F. BARKER, Baltimore: I agree with Dr. Higgins that in thyreopenia the pulse may be accelerated. The patients complain of myalgia, of chronic constipation, and of dryness of the skin and hair. Some of them have ruddy cheeks and most of them are sensitive to cold. Drs. Hyman and Kessel have drawn our attention to the neural rather than to the glandular features of exophthalmic goiter—a return to the view held in pre-endocrine times. As I understand their conception, they combine the idea of a constitutional predisposition with that of additional factors that make the potential condition become an actuality. The evolution of the malady, they believe, occurs in two steps: (1) the transformation of a potential autonomic imbalance (by means of psychic insult, or of infection) into an actual imbalance, and (2) the acceleration of the basal metabolic rate, which they do not attempt to explain though they say it may not be of thyroid origin. This conception is interesting and should be carefully considered. I should like to ask Dr. Hyman what proportion of the cases had very high basal metabolic rates? The conception of hyperthyreosis as an explanation of exophthalmic goiter is not so well founded as we should like it to be. Hyperthyreosis, hypothyreosis and dysthyreosis are hypothetic constructions, which physicians have set up in the attempt to explain certain clinical syndromes; but whether such hypothetic constructions are valid is a different matter. It is the task of pathologic physiology to be critical of such hypothetic constructions, no matter how helpful they may be as working hypotheses. The marked increase in the basal

rate in exophthalmic goiter and the fact that removal of part of the thyroid in bad cases is followed by marked amelioration of the symptoms make me hesitate to accept the view that disturbance of thyroid function is not important in the pathogenesis of exophthalmic goiter.

DR. I. H. MEANS, Boston: Dr. Higgins laid emphasis on a group of borderline cases with hypometabolism. I do not know the cause of these, but the important point to recognize is that some, if not all, of the symptoms can be relieved by thyroid. Thyroid should be used, however, with great care, and the metabolic rate should be followed. Another point that interested me was with regard to the pulse: I agree with Dr. Higgins that the pulse is an unreliable guide to metabolism. At the Massachusetts General Hospital, Dr. Field and Dr. Bock have been doing work on the minute volume of the blood in hyperthyroidism and hypothyroidism. In true myxedema they find that there is marked diminution of the minute volume of the heart, but that the stroke output is more reduced than the pulse. Emphasis has been laid by Dr. Higgins and by Dr. Barker on the type of indefinite pains seen in these cases. That interested me too, because I have seen it in my patients. There are intermittent pains resembling myalgia which disappear on thyroid medication. I have not the faintest idea of the actual cause of exophthalmic goiter. Dr. Hyman's hypothesis that there is a preexisting diathesis is an interesting one. Nevertheless, however much we speculate as to the cause, we must definitely decide about proper management of these cases. We must separate facts from theory in order to recognize the true indications for treatment. At present I believe that the thyroid, whatever the ultimate cause of the disease, is responsible through its overactivity for the more important symptoms. The effect on the circulation is partly that of simple elevation in metabolism which necessitates increase in circulation and overactivity on the part of the heart, and also perhaps in part that of nervous disturbances. The tachycardia in exophthalmic goiter is greater than one would expect on the basis of increased blood flow alone. This is important because tachycardia causes a wastage of cardiac effort; with rapid rates, total systole is increased and total diastole shortened. Dr. White has found that in a heart beating at 140, the total systole is 35 seconds a minute, and that with slower rate it may be 22 seconds. If that goes on for a long time, the effect is to deprive the heart muscle of its proper period of rest.

DR. SOLOMON SOLIS-COHEN, Philadelphia: As Dr. Barker has stated, the neurogenic theory of the origin of exophthalmic goiter is the older one, displaced largely through Kocher's work. Some observers, however, of whom I am one, have held to it throughout. We look on the goiter and the symptoms of dysthyroidism as incidents and epiphenomena. They may or may not be present. For that reason we prefer the term "Graves' syndrome" to indicate the fundamental disorder, on which the other features may or may not be grafted. The conception of autonomic imbalance, however, is much broader. It is that of an inborn, constitutional condition, out of which, according to the incidence of various exciting and determining causes, various syndromes may develop. Among the determining causes as well as the excitants are the vicissitudes of the patient's biologic history, both internal and environmental, and his native developmental tendencies. In 1893, I described, under the name of "vasomotor ataxia," a condition of instability of the neurocardiovascular apparatus through which its equilibrium becomes disturbed by causes of smaller degree than those necessary to affect the average individual; and by certain causes which do not affect the average individual at all. It was pointed out that this connection was the physiologic basis of many so-called idiosyncrasies, including hay-fever, asthma, angioneurotic edema, and other aberrant or exaggerated responses to excitants of various orders; and that it was frequently correlated with abnormal functioning of the thyroid gland.

Later, to express the idea more clearly, the term was amended to ataxia autonomica, with its English definition, autonomic imbalance, including the ideas of incoordination, instability, irregular function, etc. In the Osler Birthday volume the conception was still further enlarged to indicate a closer relationship with various endocrin disturbances.

These views have not met with general acceptance. I have therefore been very much gratified to hear the admirable paper of Dr. Hyman and his colleague, which in an entirely independent observation, traverses part of the same ground and affords, as far as it goes welcome confirmation. I have elsewhere expressed my objections to the terms used in apparent endeavor to escape the original one, by Eppinger and Hess, namely, "sympathicotonia and vagotonia," and by Morichau-Beauchant, namely, "angioneurotic diathesis"; and I am therefore still more pleased to find the present paper using, in apparent ignorance of my various discussions, that which I consider to be the inevitable term in a correct description of the conditions discussed—namely, autonomic imbalance.

DR. ELLIOTT P. JOSLIN, Boston: Care must be exercised in attributing a low metabolism to disturbance of the thyroid gland. In one group of diabetic patients there is a lowered metabolism. Prior to the work of Allen, diabetes showed a + 11 per cent., and after Allen's work started, the figures were — 11 per cent. Some of the patients had very low metabolism. I remember one which by either system, Du Bois' or Benedict's, showed from — 39 to — 44 per cent.; yet I do not think there was any hypothyroidism. These patients show dry skin, dry hair, constipation and nervousness, but they don't have headaches. As soon as they get more food their metabolism goes up. Therefore we should be very careful with this group of symptoms not to attribute it always to thyroid disturbance. In regard to goiter and mortality of operations for goiter, I am in a position to watch that, as each death in the Lahey clinic at the New England Deaconess Hospital comes under my supervision. I do not think that we should ask that the mortality in goiter should be lowered still further. It is low; it is as low as claimed by the clinic, and we turn over worse and worse cases all the time, even cases with very severe diabetes complicated with goiter. If these cases should present a high mortality, it is not against the surgeon. It is because we are taking advantage of his skill to stimulate him to do something still more wonderful.

DR. HENRY S. PLUMMER, Rochester, Minn.: It should be borne in mind that our concepts of thyroid function are largely working hypotheses which in writing and teaching are almost of necessity in sentences, paragraphs and even entire articles treated as established facts. It is impossible to avoid this and preserve a correlation of concepts except in long monographs or short articles of very limited scope. Dr. Barker's question of what was implied by the dynamic status of a cell calls for an involved statement. Briefly, it is the status that determines the quantum of energy transformed in a single excitation of a cell. Thyroxin, epinephrin, food and so forth are agents determining this status. I am one of the group who know but little regarding the etiology of exophthalmic goiter. Some of the theories that have been presented in the past may approach the truth, but to accept many of them at present necessitates a disregard of much contradictory evidence. That persons who through heredity and environment lack assurance and are prone to develop the phenomena of imbalance in the coordination of metabolic processes are also more prone to exophthalmic goiter has been recognized by most observers. On the other hand, no such evidence can be elicited in a study of many persons developing exophthalmic goiter. Furthermore, evidence of imbalance results from the physiologic status of the nervous system in exophthalmic goiter. Following the neurogenic hypothesis thus far, what I wish to insist on is the distinction of these phenomena of imbalance characteristic of man in general and the phenomena that characterize exophthalmic goiter. Our present hypothesis attributes the latter to the action of a toxin largely on the nervous system. This toxin may be an abnormal thyroid product or the product of the reactions of an abnormal thyroid product in the tissues of the body. Dr. Higgins presented a very interesting paper, one of a series that will in the near future flood literature. Regarding the majority of these cases with low basal metabolism, I wish to emphasize one point: Whether or not they are hypothyroid, we do not know. We

do know that a high percentage of the cases that have in the past been diagnosed as neurasthenia, psychoneurosis or anorexia nervosa by neurologists, having much evidence of the autonomic imbalance described by Dr. Hyman, cannot be grouped with those cases which we know to be hypothyroid. We have hesitated to report this group as long as seemed practical as it opens up a vast field for the commercialists and the imaginative "endocrinologists."

DR. WILLIAM H. HIGGINS, Richmond, Va.: Dr. Joslin has emphasized an extremely important point in excluding contributory factors, such as diabetes, which could alter metabolism readings in the cases. Only by study of the patient as a whole can one arrive at definite conclusions. If there is the slightest doubt as to the result of the basal metabolism determination, it should be repeated over and over again. Those who are familiar with the technic of this test readily appreciate how easily errors can slip in. Thyroid extract is a potentially dangerous drug, and unless it is definitely indicated, as shown by a lowered metabolism, actual harm may follow its indiscriminate use. It is remarkable how the pulse rate varies from time to time. When comparative studies on the pulse are attempted, it is essential that the count be made under similar environments. A pulse rate at the end of the physical examination may very materially differ from the rate at the beginning of the examination and may show a wide variation from the record obtained at the end of the hour's rest.

DR. H. T. HYMAN, New York: Regarding those patients whose metabolism is above + 50 per cent., our average entrance metabolism is + 43 per cent., and we consequently see quite a few patients at a level of over + 50 per cent. I do not know whether the thyroid secretion is involved in these cases any more than I know its rôle in the milder cases. I have been confusing in my discussions of thyroidectomy. I was not discussing its therapeutic efficacy so much as its bearing on the pathogenesis of exophthalmic goiter. I do not deny that patients are often strikingly improved by thyroidectomy, though whether the results are better than in the "spontaneous course" series, we shall not be able to state for some time. Naturally the basal metabolism falls after thyroidectomy for exophthalmic goiter, just as it would fall after thyroidectomy in normals. But this fall does not prove that the elevation of the basal metabolism in exophthalmic goiter is necessarily thyroidal in origin, for it may be nonspecific, just as a fall of temperature following sponging in pneumonia is not a specific effect of the sponging on the pneumococcus. The mechanism of the therapeutic efficacy of iodids in exophthalmic goiter is interesting. It seems unlikely that they can diminish thyroid secretion. It may be that they supply a deficiency, for we think that at least some time in exophthalmic goiter there is a thyroid deficiency and we have reported what is apparently a life-saving therapeutic effect from the intravenous use of thyroxin in the febrile "crises" of exophthalmic goiter. I do not believe that the morphology of the gland throws any light on its function. I do not believe that adenomas can secrete an increased or altered and toxic secretion or that they are responsible for any clinical disturbance. Adenomas are frequently found in hyperplastic glands in normal individuals and tumor tissue in the thyroid cannot function as adequately as the nontumor tissue of the same gland. With regard to a therapeutic policy in exophthalmic goiter, we would be willing to waive objections to thyroidectomy on a basis of pathogenesis, if we could be persuaded that the procedure is innocuous and palliative. But we are not yet in a position to evaluate thyroidectomy in our own series and we are convinced that, while a small handful of men can and do operate for true exophthalmic goiter with a 1 per cent. operative risk, the general mortality rate is from 10 per cent. to 16 per cent. With regard to the work on the involuntary nervous system, the best clinical description of these disorders will be found in Trousseau. Our own work is not new. But we do wish to emphasize that there has not been demonstrated any relationship between the ductless glands and the involuntary nervous system. We regard them as independent.

HOT AIR COMFORT

ARE WE HYPERSENSITIVE TO TEMPERATURE AND HUMIDITY EFFECTS?

THOMAS HUBBARD, M.D.
TOLEDO, OHIO

Americans of a few generations ago lived in habitations and hostelries having temperatures of about 55 F., and, according to medical authority of 1820, this was the desired temperature even for hospitals, the sickroom and the nursery. "Not below 50 nor above 60" was the recommendation. We must infer that they considered this temperature comfortable and healthful. The comparison of 55 F. with the standard of today will bear some explanation. The fact is that the thermometer registered only the temperature of the air and did not give a reading of the actual comfort warmth, because in those days they depended on direct radiation, the luminous heat of the open fireplace. Radiant heat, like the sun's rays, does not primarily warm the air, but rather it warms the material objects of the room, including the occupants. The interception of the luminous rays was the chief source of heat, and there was only a secondary effect on the air, owing to indirect radiation from fireplace lining and fixtures and from the warmed material objects.

This was artificial heating applied in a natural way, an imitation of sun heating. Hence, a comparison of the past and present must take into consideration the fact that 55 degrees, as the standard, did not express the degree of comfort warmth of their habitations. Our forefathers did secure healthful comfort, even though they were in an atmosphere that registered only 55. Now we demand 15 degrees higher as the average comfort temperature of homes, schoolrooms, hospitals and hotels, having advanced, or perhaps one might say retrogressed, to about 70 as the average standard. Even 75 is not rare in our offices and habitations.

HEATING METHODS

Let us review the evolution of heating methods and, by reference to the law of physics, as applied to artificial heating, determine how and why we have drifted into our present unhygienic habit of being abnormally sensitive to temperature and humidity. Europeans—in fact, all peoples in the comparable zone and, in particular, our cousins in England and Canada—still have a comfort standard of about 60.

Fire was man's first friend in his primitive state; it made possible progressive evolution and brain development. Are we from 10 to 15 degrees more brainy, and are we hotter on the trail of truth than any other peoples, or are we physically declining in resistance to nature in her frigid moods?

Sensitiveness to temperature and moisture (what we call weather) variations is largely a matter of habit. It becomes a factor in resistance to infections, lowers vitality and retards convalescence. If we admit that we are 10 degrees more sensitive, is it not about the same as saying that we are correspondingly more subject to acute infections? Such a question must awaken a solicitiude in the minds of hygienists. Medical observers abroad assert that the American soldier in service was less tolerant of the cold in field service, in barracks and in hospitals, than was Tommy Atkins or the poilu. The reason is apparent. The man who is accustomed to a 60 degree living standard is less sensitive and is more resistant to low temperatures than one

habituated to the 70 degree standard. The acute infections of our training camps can be partly ascribed to the upset of physiologic functions, as the result of hypersensitiveness to temperature changes.

We have drifted away from the standard of other peoples. American tourists abroad usually complain of the cold reception they get in travel, in museums and in hostelries, thereby advertising our inability to adapt ourselves to the foreign standard. An Englishman said that, when he first experienced American hospitality, he often felt like rushing outdoors to get a breath of fresh, cool air. A Canadian engineer, for some time a resident of the United States, confided that he loved this country and the people in the summertime, but that he and his wife were socially ostracized in the winter season, because they could not endure the hothouse reception of the American home. A New Zealander and his wife came to this country from a climate similar to that of California, intending to spend a month or two. They landed in New York in January, put up at a fine hotel, and hastily left in four days for Canada—to cool off. These Britishers were uncomfortable here, not merely because of our high temperature, but because of an unendurable combination of overheating and dryness of the air in our dwellings and hotels. These are samples of current criticisms on American heating standards.

A radical change in heating methods began with the Franklin open firebox in a cast iron stove; then came the sheet iron stove of the early part of last century. The hot air furnace and the hard coal baseburner came in about 1850, and soon afterward the steam and hot water radiators became popular. Invention and a superabundance of fuel were very seductive to a radical change in artificial heating, and we find the heat comfort standard steadily advancing. Even as late as 1860, it was still below 65 (62 was considered temperate), but it mounted to about 72 very soon after that time, and it has not dropped a degree, except during the war when the government pleaded for fuel conservation, and we endured 65 for a short time.

What is the essential feature of this radical change? It can be expressed tersely as the substitution of direct radiation, or radiant ray heating, by indirect radiation methods. The former gave a comfort warmth with a comparatively cool air content. The latter method depends on conveying heat by the hot air medium.

HEAT TRANSMISSION

This introduces the subject of the physics of heat transmission. Dry air is not a good comfort heat carrier, but moist air is. Saturated air (100 per cent. relative humidity) at 100 F. has about the same heat convection property ("effective temperature") as the same amount of dry air at 300 F. This comparison of moist and dry air as heating mediums explains the high American comfort standard. We are trying to get comfort warmth by using dry air as the medium of heat convection. The hothouse habit is a perfectly natural result.

A brief discussion of humidity may be necessary in order to explain what we mean by dry air. Water vapor is a natural constituent of atmospheric air, but there is no natural affinity between air and water vapor. The diffusion of water vapor in still air is dependent on vapor tension, and the meaning implied by "water hunger air" is a faulty conception. The problem of artificial humidification—the effort to keep the air of habitations healthfully moist—is the promotion and regulation of evaporation and the diffusion of the water vapor. In its application to habitations, it is not easy to solve. Air can carry water vapor, but it does not hunger for it; in still air, water vapor diffuses slowly. The whole process requires artificial aids; it is a real engineering problem.

Air has a definite capacity for holding water vapor, depending on its temperature. At 30 F., a cubic foot of air can hold only about 2 grains (0.13 gm.) of water vapor. At 72, a cubic foot of air can hold about 8 grains (0.5 gm.) of water vapor. In both instances, the saturation would be 100 per cent. relative humidity. The average relative humidity during the cold season in the temperate zone is high; that is, from 70 to 80 per cent. The temperature with which we are most concerned in this article is the low range, the freezing point or below. A 30 degree temperature and an 80 per cent. relative humidity means that each cubic foot of outside air carries less than 2 grains (0.13 gm.) of water vapor. When we convey this air into our habitations, either by the hot air furnace method or in the radiator heating systems by a natural leakage, and heat it up to 70, we have reduced the relative humidity to about 20 per cent. Obviously, we are trying to convey heat from stoves, furnaces or radiators through the medium of what may be called a very dry air, containing less than 2 grains (0.13 gm.) of water vapor per cubic foot (actually nearer 1½ grains [0.1 gm.] but allowance is made for body moisture, etc.). The lower the outside temperature the less is the natural water vapor (absolute humidity) content. At 20 degrees or below, there is about 1 grain (0.065 gm.) of water vapor per cubic foot brought into contact with the heater, and the relative humidity of this air, when warmed to 70, may be as low as 18 per cent. or even 15 per cent.

An indoor relative humidity of 20 per cent. has a dry-kiln effect; the walls and woodwork dry out, flowers wilt, exposed food becomes desiccated, complexions suffer, vigor is sapped by nervousness, efficiency is lowered, and even the furniture complains. Just as the piano is liable to be out of tune, so is domestic harmony. Hot air furnace heated houses will show a relative humidity as low as 15 per cent. on a very cold day. I have tested many office rooms in high buildings (steam heated, with pendent water evaporators) that gave a relative humidity of 17 per cent., and even as low as 14 per cent. An average of fourteen rooms gave 19 per cent. relative humidity. In high office buildings without artificial ventilation, each successive floor has a reduced humidity, as the structure is like an air-shaft, the natural movement of air being from below upward.

It is difficult to produce an evenly diffused humidity, when the very elements involved are contrary, and when the average human being makes a demand almost unpractical. Our forebears did not bother about this question of indoor humidity because they did not overheat the air. At their standard comfort temperature, say from 55 to 60, the relative humidity would not drop below about 35 per cent. and was probably higher even in the coldest weather because, to put it tersely, they lived in closer contact with the culinary department, and there was constant renewal of the water vapor content. Frosty window panes were more in evidence in those days.

We must recognize the fact that, in the heating of habitations, water vapor is the caloric comfort factor. In the humid summer season it becomes the discomfort

factor, and likewise in winter when a cold damp atmosphere chills us even through our clothing.

Another interesting observation confirms the statement that we are depending on hot dry air for heat transmission. Dust, suspended in the air of a room, deposits on the surface that is cooler than the air, just as water vapor deposits on the cold window pane. The ceiling and wall above a radiator soon blacken with the dust accumulation; this is a characteristic of the hot air method of heating. Obviously the heat conveying quality of the air—i. e., the "effective temperature"—depends on the water vapor content. Consequently the habit of attempting to get comfort warmth by the medium of very dry air naturally results in an absurdly high comfort standard. It is unscientific, unhygienic and extravagant. This is a good example of a vicious circle; the higher the temperature, the lower is the relative humidity, and the lower the relative humidity, the more necessary it is to have a high so-called comfort temperature.

COMFORT

The word extravagance should be explained. The percentage of heat loss varies with the comparative temperature inside and outside, and is modified by wind pressure, window exposure, leakage and porosity of structure. As we raise the inside temperature from 60 to 70, there is a higher percentage of loss than in heating from 50 to 60. It will take almost as much coal to heat from 60 to 70, as from 20 up to 60. This comparison implies more or less imperfection in heating apparatus and faulty house construction—there are many factors involved not possible to estimate theoretically—and the only fact to be impressed is that a high comfort temperature should be classed as an extravagant luxury. The practical point is that a reduction of even 5 degrees means less extravagance. How can this be accomplished without discomfort? The answer is by conditioning the air used as a heating medium. We should have a proper water vapor content in our habitations and office rooms. This is the engineering problem. The first step is to create a popular demand and establish practical standards. Invention will respond to the demand. (The kind of occupation, the physical activities and the sedentary habits of a room's occupants have a bearing on the relation of humidity to comfort and efficiency; the rate of movement of the air content is also a factor. It seems best to limit this discussion to ordinary sedentariness in still air, such as obtains in homes and offices.)

In order to aid in establishing a standard, we may call attention to a yearly occurrence. In the fall of the year, the air of our houses has about the same relative humidity as that outside, owing to the free ventilation of the season. The contents of the house have absorbed moisture up to the normal. Cool days come, yet we are in no haste to light the furnace fire, an occasional open fire of an evening being sufficient. If we take a look at the thermometer, we find that there has been no complaint of discomfort even at 63 or 65 degrees. This means that the vapor content, probably near 50 per cent. relative humidity, warmed to 65 degrees, gives comfort, even though we have not donned cold weather clothing. That helps to fix a temperature standard, but it must be said that 50 per cent. relative humidity is rather too high for artificial humidification. The hygienic standard should be 65 degrees with from 35 per cent. to 40 per cent. relative humidity, for persons of normal health and vigor. Sixty-eight degrees of temperature with about 40 per cent. relative humidity should be the accepted maximum standard. This is a practical compromise, with a prospect of a progressively improved hygienic standard.

The term comfort zone, as used by heating engineers, merits explanation, because it is suggestive of the tendency of authorities on the subject to encourage a rather high temperature standard. For instance, 74 degrees and 20 per cent. relative humidity is reckoned as the comfort line, as also is the combination 70 degrees with 46 per cent. relative humidity. By contrast, we note that 68 degrees would require a 63 per cent. relative humidity to be at the same comfort line. It is impracticable to maintain a relative humidity above 40 per cent. in habitations, and, consequently, we tend to take the most convenient course; that is, to tolerate the standard of about 75 degrees with about 20 per cent. relative humidity.[1]

Hothouse coddling results in vagaries in wearing apparel. Fads cut loose and run to extremes. Just now, the lower extremities are on parade, and the fashions of the day exemplify the saying that clothing is for adornment and has little or no relation to comfort and utility. The high temperature standard tends to foster freak dressing, and one half-clad office employee dictates the temperature standard to others. The same is true of groups in public conveyances and in the home. The hypersensitive one compels all to tolerate his standard.

The thermometer is not popular nowadays. This is an age in which sensations alone can be depended on; and the worst of it is, that in a controversy, perhaps with her husband or the manager who relies on the mercury, it usually turns out that the complainant wins. A temperature of 70, with a very low relative humidity, may be actually chilly. So we stoke up the dry-kiln heater and roll along in the vicious circle with the comfort goal receding.

The skin and respiratory mucosa form the great, expansive sentinel area regulating the vasomotor system and heat loss. Evaporation from this area dissipates heat, and in a very dry atmosphere there may be a feeling of chill, even though the thermometer reads 70. The conventional clothing of civilization, combined with unhygienic heating, has literally doped the sentinel into sluggishness and has upset the physiologic function of the heat regulating mechanism. Sensations of discomfort follow and the subtitle of this article is confirmed: We are hypersensitive.

TYPES OF FURNACES

I have said that artificial humidification is an engineer's problem. For instance, in a hot air furnace system it is necessary to change the whole cubic air content from three to five times an hour, in order to convey the heat in very cold weather. To insure rapid changing, the air must be delivered from the furnace at from 120 to 150 degrees (some advertise 190). That is ventilation, surely, but it is a progressive desiccated process. Unless moisture is added, there is 15 to 20 per cent. relative humidity, and the more rapid the change, the lower the actual vapor content. In a nine-room house of about 20,000 cubic foot capacity, it would be necessary to vaporize 3 quarts of water an

1. The sling psychrometer, as used by U. S. Weather Bureau, is the most reliable humidometer. Stationary humidometers give misleading data, and textbooks and current literature give evidence of faulty readings of apparatus of precision. Even temperature-taking requires special precautions, such as properly placing the thermometer, and in comfort arguments the personal prejudice must be eliminated.

hour, more or less depending on the outside temperature, and on the inside temperature demanded. (If bedrooms and kitchen are not reckoned, the total is reduced.) As compared with 70 degrees, a standard of 65 would require about one-third less added water vapor to maintain a 35 to 40 per cent. relative humidity. The lower the standard temperature the less is the amount of water to be vaporized. But at least from five to eight gallons must be vaporated to maintain a fair humidity under the conditions mentioned—a nine-room house, hot air furnace and cold weather.

The term hot air furnace in this article is applied to that kind of a heating system which has only the direct cold air intake, without provision for rotating or recirculating the air of the house. When the outside temperature is very low, say below 20, the furnace must be very hot, the air must be delivered at the register superheated and, in order to convey sufficient heat, the air content of the rooms must be changed three or more times an hour. This is equivalent to heating three or more times the actual cubic air content of the house. Most of these hot air furnaces have a small water pocket in the side of the sheathing of the furnace, but the amount of water actually evaporated is negligible—it makes no impression on the relative humidity of the air of the house. The enormous amount of air in circulation makes humidifying unpractical. Such is the type in general use, and the term hot air is used as a selling attraction.

A heating system called the warm air furnace system is winning favor. The essentials of this system are a comparatively larger heating chamber and a perfected method of rotating (recirculating) the air, the return flow to the furnace coming from the cooler parts of the rooms or the hall. Fresh oxygen is supplied by natural ventilation. There is also leakage and a partly opened window situated just above the return flow register makes it practical to let in outside air without perceptible floor drafts. The working result is the warming of a large volume of air which enters the heating chamber not below 50 degrees and which is delivered at the register at a lower temperature than in the hot air system. Consequently the rate of air movement is slower, and it is practical so to condition the air that a fairly healthful humidity is assured. This is accomplished by an evaporating pan of considerable surface area, constructed as a part of the casting of the furnace. The water supply to this evaporating device can be regulated by the visible drop method. This special system is proving its claim to be called the warm air system. Recirculation gives air movement and even diffusion of water vapor, and the practical result is comfort at 68 degrees with 35 per cent. to 40 per cent. relative humidity.

The regulation of natural ventilation by windows or special devices will give a constant oxygen renewal, and as the inflow is influenced by the direction of the wind—a positive pressure on the windward and negative pressure on the leeward side—it is of advantage to have available ventilation inlets on at least two sides of the house.

Some furnace systems combine recirculation and air direct from the outside to the furnace heating chamber. This is more complicated to manage than ordinary natural ventilation, because of the above mentioned variation in air pressure, with varying winds.

Steam and hot water heating systems depend on leakage and natural ventilation for air renewal. The very names suggest humidity, but that is a delusion. A house heated by radiators can become just as dry as one heated by a hot air furnace system. It is difficult to vaporize water from a pan on the radiator, because the temperature is not high and diffusion is slow. One can make an impression on the average humidity by assiduous attention to many evaporating pans, but it is a real task—gallons to be evaporated daily—and, at best, only a partial success. Even a 30 per cent. relative humidity will help bring down the comfort temperature, and that is worth while. (The pendent water holders are quite useless, but there are some very effective evaporating pans on the market and also steam and water jet vaporizers more or less practical.)

We have considered three types of heating methods: the hot air furnace, the warm air furnace system and steam and hot water radiator heaters. Humidifying is difficult in all, but the warm air recirculation system combines a healthful humidity with fair ventilation. The hot air furnace and radiator systems, and likewise stoves, exemplify the statement that indirect radiation attempts to convey heat by the medium of very dry air. These types are the most popular heating systems, which have during the last half century made us victims of the hot air habit.

The various methods of humidifying the air, all with more or less complicated operating detail, emphasize the fact that this is a difficult problem, approach it as one will. It is one of the complexities of the artificial life, the outstanding feature being the high temperature standard which tends to make healthful humidification almost unpractical.

The reaction against frosty window panes is due to the notion that they always indicate bad air. This has been and even today in certain instances may be a correct inference, but we have gone to the other extreme in avoiding humidity. We should appreciate that with a properly conditioned air in the home a considerable frost deposit on the window is, in cold weather, one indication of a healthful atmosphere.

The open fireplace should not be neglected as a factor in home comfort. Its function is to supplement indirect radiation by direct luminous ray heating, in cold weather and between seasons. Properly utilized, the oldfashioned fireplace will help to bring comfort at a moderate temperature.

VENTILATION

Ventilation must be included in a hygienic survey of heating systems. I have left it for a closing comment, because, generally speaking, it is of comparatively less importance in the home life than is air conditioning. The cubic content per capita is usually ample to supply oxygen, and generous ventilation of bedrooms is the usual practice. A few years ago hygienists concentrated on carbon dioxid as the health destroyer, but now they understand that this exhalation gas should be considered merely as an index of air vitiation, and that it is deleterious chiefly because it displaces oxygen. The ventilation and humidification of the air of schoolrooms, hospitals, auditoriums, etc., presents special engineering and hygienic problems, the discussion of which would confuse the main issue. Air conditioning has already made great progress in certain commercial institutions, proving that it is practicable.

One of the striking results of a high comfort temperature, from 70 to 74, for instance, is that the occupants of a room become hypersensitive to drafts. The hotter the air content, the more shocking the effect of a

cold air current sweeping along the floor from an opened window. Air from outside does help to restore invigorating oxygen, but it does not materially affect the moisture content, because the absolute humidity of cold air—the water vapor content—is very low and, when warmed up to 70, this volume of fresh air soon becomes about 20 per cent. or less relative humidity.

Ventilation should be practiced consistently, and this is one of the objects to be attained by conditioning the air of habitations to the proper humidity standard. The fact is that a healthful degree of humidity, and the moderate temperature that goes with it, mitigates the cold shock of a draft of outside air. The warmed water vapor, permeating even the clothing, prevents sudden chilling, and a healthful humidity becomes a factor in reducing the shock of cold, damp air on the mucosa of the respiratory tract. We would hear less about the beastly climate, if we were not made soft by the hothouse habit. The popular annual migration to the sunny southland is a confession of discomfort in office and home life; we exaggerate the vicissitudes of weather. This kind of complaining carries an admission of lowered vitality in physiologic resistance to cold.

SUMMARY

Americans are becoming progressively more sensitive to temperature and humidity.

The popular demand seems to be for higher radiation capacity in the home, in hotels and in public conveyances. (What a shock it would be to the heating trade if we accepted a 65 degree standard.)

Climatic conditions and sudden variations of weather are naturally very trying and we invite cold shock by hypersensitiveness.

Unhygienic heating combined with foolish estheticism in clothing (e. g., chiffon to furs) results in acute and chronic diseases of the upper and lower respiratory tract. Catarrhal affections, such as chronic sinusitis even in young children, are far more prevalent than should be tolerated by an enlightened, intelligent people. Medical progress in the study of causes of such diseases is one of the outstanding features of this age, but treatment and cure are handicapped when the unhygienic habit is in itself chronic.

The complexion is the color index of good blood and normal skin circulation. It is notorious that in America the natural color index is fading and the cosmetic index is correspondingly high. The skin, like the respiratory mucosa, is actually damaged by hot dry air (and likewise is the hair) and become more liable to chronic diseases.

Our present high temperature standard so lowers natural resistance to minor and major infections that restoration to normal health is retarded. The fresh air treatment of hospital surgical cases is testimonial to the healing virtue of tonic temperature and natural humidity in convalescence.

We must not delude ourselves into thinking that invention in the line of better conditioned warm air in our habitations is going to be given to us without rational effort on our part. Public sentiment must be educated to demand the reform, and the heating and ventilating business will surely respond. But even with perfected mechanical humidifying devices the desire to live hygienically can ge realized only by sustained, intelligent effort. We need a new conception of the deeper meaning of that good Anglo-Saxon word comfort.

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ROENTGEN-RAY TREATMENT IN BRONCHIAL ASTHMA AND CHRONIC BRONCHITIS *

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This paper is not intended to be a presentation of anything absolutely new, but is rather a fresh emphasis on a field of radiation treatment that has been largely neglected in this country. The roentgen-ray treatment of bronchial asthma and chronic bronchitis has been developed chiefly in Germany. In fact, the available literature is almost entirely German. I know that some of the American radiologists have been using this treatment for years, but the value of the method has not yet penetrated the general literature.

Bronchial asthma is not, of course, a true disease entity; it has a wide variety of causes. The work, during the last decade, of Walker and his associates on the intrinsic specific causes of asthma has widened this field considerably. The present ideas with regard to anaphylaxis and protein sensitization have made the treatment of many of these cases much easier and much more hopeful. In addition, the recognition of extrinsic causes of asthma, such as nasal polypi, spurs, hypertrophied turbinates and chronic diseases of the abdomen, has been another help. In many of these cases, removal of these pathologic conditions has resulted in the entire disappearance of the asthma.

In spite of the valuable work in the fields mentioned, there are many patients who have undergone all types of sensitization tests, vaccine treatments, and removal of pathologic conditions in the upper respiratory tract, and yet their asthma has persisted, with perhaps an increasing frequency and severity of the paroxysms. It was just this type of unsatisfactory case that attracted my interest to the possibilities of roentgen-ray treatment.

One of the difficulties in the application of any novel therapeutic method is the fact that the exact mechanism of its action may not be entirely clear. That need not necessarily prevent us from employing the method. We are all familiar with the wonderful results that have been obtained by roentgen-ray treatment in various blood diseases, in diseases of the skin, in benign and malignant tumors, etc., yet in all these groups the exact mechanism of the beneficial effects of the rays has certainly not been worked out to a thoroughly satisfactory degree.

In the treatment of bronchial asthma with roentgen rays, two distinct methods have developed. Groedel and Lossen divide the methods into the direct and the indirect.

THE DIRECT METHOD

The direct method is the older one. This is the method of applying the rays directly to the thorax and its contained organs. The first cases date back to 1906, when Schilling accidentally discovered the beneficial effects of roentgen rays in asthma. He was making a fluoroscopic examination of the chest of an asthmatic patient for diagnostic purposes. This patient suffered from such severe paroxysms that he frequently had incontinence of urine and feces with his attacks. When Schilling saw the patient several days after this examination, the latter voluntarily told his physician that

* Read before the meeting on radiology in the Section on Miscellaneous Topics at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

for the first time in more than three years he had passed twenty-four hours without cough or expectoration. Naturally this excited Schilling's interest, and he started to treat other cases of bronchial asthma with roentgen rays. In most of the cases, he obtained an amelioration of the symptoms, a lessening in the amount of sputum and a lessening and even a disappearance of râles.

Since his time, a number of authors have contributed reports of similar cases. Steffan, Levy-Dorn, Epstein, Gottschalk, Immelmann, Bachem, Klewitz, Wetterer, Groedel and Lossen are the most prominent among the contributors to this field of therapy.

Wetterer also had some interesting experiences with accidental cures of asthma. He used the roentgen rays for the treatment of a case of acne of the chest and back, and also for a case of pruritus of the back and axillae, in which associated asthmatic attacks were found to have been cured.

Steffan utilized microscopic study of the sputum as a control in studying the effects of the treatment. He found not only a definite change in the amount and gross appearance of the sputum, but also a diminution and gradual disappearance of Charcot-Leyden crystals, of Curschmann's spirals, and of eosinophilic granules. Wetterer confirmed this and also found that the eosinophilia of the blood was reduced, following irradiation.

Schilling's last report was in 1910, at which time he had already collected sixty cases. He was able at that time to control the results in many of his earlier cases. He found that about one fourth of all the old patients had been definitely free from symptoms for more than two years. He was very enthusiastic about the method even in obstinate chronic cases, but felt that the chronic bronchitis of young people gave much more satisfactory results.

According to Schilling, the beneficial effects of the roentgen rays were due to the action on the ciliated epithelium in the walls of the bronchi, and particularly to the effect on the goblet cells which secrete the mucus. Gottschalk, on the other hand, believed that the action was primarily on the enlarged peribronchial and tracheobronchial lymph nodes. This is the idea that has pervaded the later literature, and seems to represent the general consensus of opinion. The presence of these enlarged glands is capable of causing irritation of the fibers of the vagus system. This irritation eventually produces the bronchial spasms that constitute the asthmatic paroxysm. Similar exciting irritations have been known to exist in such conditions as tumors and aneurysms. We have known for many years that roentgen rays are a valuable agent in producing a shrinkage of lymph nodes, enlarged from any cause. It is therefore reasonable to believe that in asthmatic cases, in which we can often roentgenographically demonstrate these enlarged nodes, the rays may have a similar shrinking action.

Holthusen has called attention to another possible explanation of the good results in the treatment of asthma. The desensitizing action of roentgen rays has long been known in connection with such conditions as pruritus, trigeminal neuralgia and sciatica. Here it is supposed that the analgesic action is due to a lowering of the threshold of sensibility of the nerve endings. In asthma, it is probable that a similar lowering of sensibility of the nerve endings of the vagus system might be produced following exposure to the rays.

Levy-Dorn and others have thought that, possibly, some of the results obtained in the relief of symptoms might be purely the results of suggestion. It is impossible, however, to explain on this basis the definite objective changes that result, particularly in the diminution in the amount and character of the sputum as well as in the lessening of the abnormal contained elements.

THE INDIRECT METHOD

The other general type of treatment is the indirect method, in which the rays are not applied to the thorax. This method, which has been utilized chiefly by Groedel and Lossen, also had an accidental basis. These authors were called on to treat a patient with leukemia, and they administered some roentgen-ray treatment to the spleen. The patient was a man, aged 56, who had been suffering from severe asthma for sixteen years. The physicians knew nothing about his asthma at the time, but continued to treat the spleen for leukemia. Nine months later the patient, whose leukemia had improved, told them that after the first application of the roentgen rays to the spleen, the asthmatic paroxysms had stopped, and there had been no return since. Following out this lead, they treated a number of other cases of asthma. Eventually they were able to report a series of forty-one cases of bronchial asthma in which the roentgen rays had been applied merely to the spleen, with no direct treatment of the thorax. Out of these patients, thirty gave excellent or good results as regards diminution or disappearance of the asthmatic attacks. In a number of cases, a single splenic exposure was sufficient to stop the asthma for weeks or months. More than three splenic treatments were not given in any case. Too frequent repetition was thought to be dangerous.

Groedel and Lossen also noticed that with the splenic exposure there was apt to be a general constitutional reaction of varying degree. In many instances, it was very severe and consisted of nausea, vomiting, headache, general prostration, possibly a rise in temperature, and sometimes diarrhea. Groedel noted that in the cases in which this reaction had been very severe, the eventual relief from the asthma was apt to be most striking and lasting. On careful study of the patients who recovered, he found that the great majority of them had had a very marked constitutional reaction. He concluded, therefore, that the severity of the secondary roentgen-ray reaction ran parallel with the amount of benefit to be derived from the splenic exposures. Incidentally, he felt that the constitutional reaction was due to a disturbance in the balance of the endocrine system. He did not observe any other bad results from the effect of the rays on the spleen. Some objectors thought that the treatment might produce splenitis or perisplenitis. No real evidence was brought out to show that this had ever been produced by the rays.

The explanation of the effect of splenic exposures is not very clear. Groedel was imbued with the idea of "Reizdosen," or stimulating doses, which Stephan had advocated. He believed that the small doses which reached the depths of the spleen stimulated it to the production of substances that acted like antibodies, and either modified the anaphylactic seizure or did not permit the production of the asthmatic spasms. This conception of stimulating doses is being gradually abandoned. In the present instance it seems more probable that the rays, even in small amounts, have some destructive action on the more embryonal cells of the splenic structure. The products of destruction

probably initiate some sort of immunizing mechanism, acting possibly as antibodies, or perhaps stimulating the production of the latter. The recent work of Fried on the use of small doses of roentgen rays in inflammatory processes throws some light on the possible mechanism here.

COMBINATION OF DIRECT AND INDIRECT METHODS

In my own work on bronchial asthma, I have felt it desirable to use a combination of both the direct and the indirect methods. I expose the front and the back of the chest, and in addition give an exposure over the front of the spleen. In this way, I believe that the number of good results is apt to be greater than by the use of one method exclusively. We can get the good results from the chest treatment of those cases in which there is an obvious enlargement of the lymph nodes, and yet we will not miss the beneficial action in other types of cases in which it will be necessary to utilize the immunizing reactions.

I shall not attempt to present any statistical studies of my cases. The majority of the patients were treated in the roentgen-ray department of the Boston City Hospital. In a large municipal institution of this type, it is obviously impossible to follow up cases with any great satisfaction. In the future, however, I hope to be able to collect some figures regarding the permanence of the results and will submit them in a separate communication.

TECHNIC OF APPLICATION

The technic is simple. In the cases of true bronchial asthma I prefer to treat with the rays of short wavelength, using a voltage of either 170 or 200 kilovolts according to the apparatus available. The filter is 0.5 mm. of copper with 1 mm. of aluminum; the distance from target to skin is 50 cm. The dosage administered is from 10 to 15 per cent. of a skin erythema dose. I cover an area about 8 inches square over the front of the mediastinum, and a similar area over the back, at the same level. These two fields will include the main bronchial subdivisions. An area of the same size is treated with a similar dose over the front of the spleen. The three fields are treated on three separate days. In patients who are weakened by severe paroxysms, I prefer to have a day of rest after each exposure. This course of treatment is repeated if necessary in three or four weeks. Later treatment is guided by the condition of the patient and by the character of the constitutional reaction. Recently I have been cutting the dose down somewhat smaller and giving only from 8 to 10 per cent. of an erythema dose over each area. This is particularly advantageous with patients who are weak, and in whom we fear too great a secondary reaction.

I have noted the same severe general reactions that Groedel described, and also the parallelism between the severity of the reaction and the efficiency of the treatment. It seems to me that in the future we shall probably use smaller doses and perhaps avoid much of this reaction. By doing this, however, we may not get the prompt and effective response to treatment that we frequently obtain at present. This is one of the problems that remain to be worked out.

Clinically, some of the cases have presented very spectacular results.

One patient, J. G., aged 45, had had severe bronchial asthma for five years. He had undergone numerous courses of vaccine treatment with only temporary relief. For the last two years his attacks had been worse than before, and for one and one-half years he had never been more than several days without taking epinephrin. The spasms occurred chiefly at night, and he had acquired the habit of spending his nights sitting in a chair, dozing between attacks. Altogether, he had the worst case of asthma that I have ever encountered. I administered a course of treatment as described, with a day interval between the areas. There was a profound reaction, almost a collapse, lasting for a week. From the beginning of the prostration, however, the asthmatic attacks left him entirely. He did not have another attack for about four months, which was the longest interval without spasms for several years. At the beginning of a spell of cold weather he began to be uncomfortable. By giving smaller repeated doses I was able to control the paroxysms and make him fairly comfortable.

There is a wide variety of clinical response to the treatment. Some cases require only a single series of treatment, and may be symptom-free for many weeks or even months. It is best to be cautious and undertreat rather than overtreat. In a fair proportion of the cases there will be an initial increase in the frequency and severity of the spasms as well as an increase in the amount of sputum. For this reason I always like to treat one area at a time. If there is no increase in symptoms, I am ready to complete the series in regular order; otherwise, I prefer to wait another day. After the initial increase, in favorable cases the symptoms will begin to diminish and eventually disappear.

In addition to the cases of true bronchial asthma, the roentgen rays are of value in chronic bronchitis without any asthmatic symptoms. My own experience has been more with young children than with adults. The experience of the authors previously mentioned seems to agree generally that the treatment is more efficacious in younger persons. However, even in very long standing chronic cases some improvement may be produced. Of course, if permanent secondary changes have taken place in the lungs, the chances of relief from roentgen-ray treatment are not so hopeful. However, Schilling reports cases with definite bronchiectases in which he was able to measure the diminution in the daily output of sputum following the treatment. One case started with 75 c.c. daily, which diminished under roentgen-ray treatment to 5 c.c. within a few weeks. In my own practice, I have had two cases with bronchiectases of moderate extent. In both there was considerable relief from the treatment. In one of them, even though the rays were not applied to the spleen, there was a marked general reaction similar to that seen in the asthmatic patients.

In children, the treatment is especially applicable to the cases of slow disappearance of cough after pertussis. In many of these cases we are able roentgenographically to demonstrate enlargement of the tracheobronchial and mediastinal lymph nodes. Liebman of the Boston Children's Hospital, in a private communication to me, has described the results he obtained in a series of thirty such cases, practically all of which were cured by roentgen-ray treatment. I have also had cases of long standing cough in children lasting for some months, after an attack of influenza or grip. In these cases only a small amount of treatment is necessary. Sometimes three or four very tiny doses spread over an interval of two weeks will be sufficient to stop the cough. Liebman found that the roentgenographic examination of the chest after treatment did not show any very marked changes in the glandular conditions, although clinically the improvement was tremendous. This corresponds with my own experience in the few

cases that I have been able to control by films after the treatment.

The technic with cases of chronic bronchitis is essentially the same as with asthma, except that the treatment is limited entirely to the anterior and posterior projections on the chest. I do not irradiate the spleen in these cases. The doses are slightly smaller than with asthma and are repeated every two weeks. In these cases, it is not necessary to use the short wave-lengths. If a spark-gap equivalent of 8 or 9 inches is available, we can use 3 or 4 mm. of aluminum and give 10 or 15 per cent. of the skin dose. With the very young children I give a much smaller dose, so that it can be repeated safely at intervals of twice a week.

SUMMARY

Many cases of true bronchial asthma do not respond to the removal of supposed extrinsic causes or to specific therapy, even though careful sensitization tests have been made. A large proportion of these patients may be markedly benefited by careful roentgen-ray treatment. In favorable cases there is a lessening and even a disappearance of the paroxysms and cough, a change in the amount and character of the sputum, and a diminution of the abnormal microscopic elements in the sputum.

Two types of roentgen-ray applications are used, one directed to the mediastinum and chest, and the other to the spleen. The mediastinal treatment probably has its effect through a shrinking action of the rays on the enlarged tracheobronchial and mediastinal lymph nodes, with subsequent diminution in the irritability of the local fibers of the vagus nerve. The mechanism of the effect through splenic exposure is not so clear, but may possibly be concerned with the release of antibodies which modify the anaphylactic seizure.

Chronic bronchitis without asthmatic attacks can also frequently be helped by application of roentgen rays to the mediastinum. The most favorable results are obtained in younger people, particularly in children who have persistent coughs after attacks of grip or pertussis. Cases of secondary bronchiectases that are not of surgical extent may be improved when other treatment is ineffective.

ABSTRACT OF DISCUSSION

DR. SAMUEL STERN, New York: We have been doing this work for a great many years at the Mount Sinai Hospital in New York. We originally started by treating children who came to the clinic with asthma, and in whom roentgenogram showed that they had large glands at the hilum which we thought was possibly the cause of the asthma. After very few exposures, in the majority of these children, the asthmatic attacks decreased in intensity, and then finally after a comparatively short time, they disappeared altogether.

At this time, and for many years after that, we were using the low voltage treatment. We were filtering with 3 or 4 mm. of albumin, giving them half doses alternately from the front and the rear of the chest at weekly intervals. About a year and a half ago we took up the treatment of tuberculous adenitis with high voltage, with very small fractional doses, and we tried out the same technic in the treatment of these cases. The results have been most satisfactory. We give about one tenth of an erythema dose at weekly intervals. In the cases in which the asthma is due to an old unresolved pneumonia, our results have been even better. On examining them carefully, we find that usually there is some area in the chest which has not cleared up. This may be rather small, but a roentgenogram generally shows it, and a comparatively limited number of treatments bring on a resolution, with an improvement of the asthma. The splenic treatment spoken of by Dr. Gerber we have not tried yet. I am a little bit afraid to do much irradiating over a normal spleen. I do not mind treating the spleen when I feel that it is the seat of trouble, but I am a little bit reluctant to treat a normal spleen with a normal blood count. I do not know what doses these patients were getting. If they are getting only a very small fraction, such as a tenth or even less, I dare say it would be quite safe to treat them, and I am going to try it out. I should like to ask Dr. Gerber whether this series of cases that Dr. Groetel reports were all due to enlarged nodes in the chest, or whether there were other types of asthmatic conditions included. It is difficult to tell how the ray does its work in these cases. At one time, when we were treating with low voltage in comparatively large doses, we thought the action was direct on these nodes, making them shrink and disappear, though we found that often the asthma was improved before the nodes diminished much. But since that time, I think we have come to the conclusion that the rationale of the treatment is on a different basis. It is probably due to the more rapid stimulation of the antibodies.

DR. ISAAC GERBER, Providence, R. I.: I know that many Americans have been doing this work for many years, only unfortunately it has not spread over into general medicine. I have gone through the same attitude in regard to the character of the rays as Dr. Stern has. I have been doing practically all my treatment with the shorter wave lengths and copper filtration. I have been giving essentially the same dose as Dr. Stern, about 10 or 15 per cent., except that from now on I am inclined to give smaller and smaller doses. I am becoming convinced that the smaller doses will be much more efficient in starting these various mechanisms, and will be apt to produce far less harm. The same proposition applies to the spleen. With the dosages that I have been using, 10 per cent. or less on the spleen, with no repetition, or, perhaps, one or two repetitions at monthly intervals, I do not believe that any harm can result. With regard to the matter of unresolved pneumonia producing asthma, that is what I referred to, although I do not use the word pneumonia, in many of these cases of long standing cough after influenza or pertussis. Many of them are cases of bronchopneumonia that have not entirely resolved, and they can be demonstrated definitely on the roentgenograms. I feel that if this method is utilized more, we shall be doing an enormous amount of benefit for patients who are now shoved off in the outpatient departments of clinics and given potassium iodid and told that there is nothing that can be done for them. The asthma patients are constantly given increasing amounts of epinephrin, possibly morphin, and either of them to excess is not particularly good. I do not pretend that all these cases are going to be cured or ameliorated, but at least we have an agent that deserves more wide application, and one by which certainly a fair proportion of those hopeless cases can be helped.

Federal Government Public Health Activities.—The jurisdiction of the federal government in public health matters extends over foreign intercourse, interstate intercourse, federal territory and administrative affairs, including protection of the Indian tribes. As an example of these fields of activity and the methods of covering them, the District of Columbia may be cited as a strictly federal territory wherein local health matters are especially legislated for by Congress. It has likewise enacted laws to safeguard the life and health of the army and navy—highly important agencies in the administrative affairs of the government. Laws have likewise been enacted and agencies created to protect the Indians, the special wards of our government. In matters of health relating to international and interstate intercourse, the United States Public Health Service is the agency depended on. It operates through its own department—the treasury—or in cooperation with other departments having to do with factors other than health affecting international or interstate commerce.—Kerr, J. W.: *Pub. Health Rep.* **40**:1677 (Aug. 14) 1925.

PHYSICAL THERAPY *

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Editor, The Journal of the American Medical Association
CHICAGO

No doubt the first agents of treatment used by man were those which could be had through simple adaptations of things natural. The application of heat and cold, rubbing and massage, and the use of water and of sunlight are as old as man himself. In the aphorisms of Hippocrates one reads of the uses of such methods; even at that time sound observers seem to have realized that these agents may act for good or for evil.

"Heat is suppurative," says one aphorism, "but not in all kinds of sores; but when it is, it furnishes the greatest test of their being free from danger. It softens the skin, makes it thin, removes pain, soothes rigor, convulsions and tetanus." But again, "Heat produces the following bad effects on those who use it frequently: enervation of the fleshy parts, impotence of the nerves, torpor of the understanding, hemorrhages, deliquia, and along with these, death." And in commenting on the latter aphorism, Galen and, still later, Celsus, said: "By 'heat' is meant 'hot water' or a 'hot fomentation.'"

Massage, too, was practiced in the earliest times: Anthropologists and ethnologists have described the practice as it exists among savage peoples today, and accounts are found in primitive medical texts. It is repeatedly referred to in the folklore of all nations, particularly in the tales of the Arabian Nights. Such massage included not only simple rubbing, but also pinching and kneading, later classified by French and Swedish investigators with technical terms.

The ancient Egyptians, the Greeks and the Romans were firm believers in the health-giving powers of the sun's rays. Indeed, Herodotus asserted that light must be regarded by the physician who knows his business as a means of repelling illness and as a subsequent aid to recovery. There were sun rooms in the homes of all the well-to-do Romans, not glassed-in sun-parlors facing north, as in our apartments today, but large central spaces, open to the sky and to the sun itself.

Humphris tells us that the first use of electricity in healing took place in the time of Tiberius, some twenty years after the death of Christ, when a physician named Scribonius Largus made use of the Raja torpedo-fish for rheumatism and for headaches. The electric ray-fish and the electric eel of Brazil are said to be able to convey a considerable shock. Scribonius Largus was, however, known chiefly for the scope of his writings, as his name no doubt indicates. His recommendation was based, apparently, wholly on empiricism. Much the same sort of reasoning assigned unusual virtues to mixtures of drugs of foul smell or of nauseous taste. The results commonly are the proof of the power of suggestion.

Of the birth of the roentgen ray and of the finer electric apparatus of our modern times, accurate descriptions are easily available. From the primitive observations of the past have arisen these remarkably complicated devices that have made necessary increased knowledge by the physician of physics and of chemistry, of physiology and of biology, and that call for a finer discrimination in their choice and in their application to disease than it has been necessary to accord to many of the drugs used in medicine.

* Read before the American Electrotherapeutic Association, Drake Hotel, Chicago, Sept. 16, 1925.

SCIENCE VERSUS EMPIRICISM

The proper evaluation of evidence regarding the use of new methods in the treatment of disease is difficult. The patient is anxious to be well, the physician wants to see him cured or at least benefited as promptly as possible, and his friends and relatives constantly endeavor to encourage him, regardless of their actual belief as to the state of his illness. The result of this continuous positive suggestion is to lend to any method of treatment that may be employed a credence that is perhaps not its actual due. Few physicians—and, indeed, few scientists—can resist the hyperenthusiasm that is likely to follow a first successful result. The paths of the history of therapy are bestrewn with the wrecks of new cures that sailed forth as the last word in therapeutic achievement. Mental, manipulative, natural, mystical, spiritual and other cures have been brought forth by apostles of healing and vaunted as the secret for the solution of all the problems of healing that have confronted the physician since the earliest times. But when the apostle died, or when the primal faith that animated his followers disappeared, the cure went the way of the apostle.

Now physical therapy has been more subject to misunderstanding of its efficacy in varied conditions than has any other form used by the scientific physician. The potency of the placebo depends only on the mental suggestion and on the personality of the man who administers it. His contact with the patient is not direct. The contact of the chiropractor, the osteopath and the religious healer consists usually of the direct laying on of hands. Few physicians of experience fail to realize the importance of such immediate relationship to the patient. If more physicians took the trouble to make thorough examinations of their patients, never failing to examine the chest after the clothing had been completely removed from the upper part of the body and using auscultation, percussion and palpation, which are fundamental to physical diagnosis, there would be fewer failures and many more persons satisfied with the care of their physicians.

Without doubt, powerful suggestion is conveyed by the use of any intricate or striking mechanical method. The use of electricity, including the direct application of the current, the galvanic apparatus, pocket batteries and all the assorted forms of waves supplied through more intricate mechanisms, as well as the use of electricity to produce heat and light, is a striking therapeutic procedure. The late—but not too late—Albert Abrams well knew the value of intricate apparatus for impressing the patient and, even more, for impressing the uncritical physician. His first venture, spondylotherapy, carried with it a physically intensified suggestion; and those later Goldbergian evolvements, the oscilloclast and the biodynamometer, were impressive in their complexity even to some competent physicians.

Regardless of the fact that the underlying basis for many physical methods never has been thoroughly established and, indeed, is not even yet perfectly understood, the official organ of the American Electrotherapeutic Association only recently said: "The various irregular cults have also worked out in some instances methods that have sometimes succeeded where the rank and file of the medical profession have failed." The editorial referred to cites particularly the treatment of sacro-iliac strain, recommending, first, adjustment and, secondly, the application of electricity. On what basis does the editorial presume to say that displaced vertebrae once adjusted remain adjusted, unless held in

place over long periods of time by methods of fixation? Who has proved that ligaments that are relaxed will resume their functions when the supposed luxations are properly replaced? Who has made the scientific studies, using the roentgen ray and all the other methods known to modern science, by which even an iota of truth can be attached to the claims of chiropractic and, indeed, to most of those of osteopathy? Granting that there is a modicum of truth in the claims of the latter cult, what scientific organization will be willing to admit that half-educated and incompetent men with no thorough understanding of the human body and its mechanisms should be privileged to apply any single form of therapy or diagnosis?

THE DANGERS OF SYSTEMS AND SPECIALTIES

If medicine is to be partitioned off into a series of specialties and cults practiced by men who have learned only one organ of the body or only one system of diagnosing and of treating disease, medicine as a science is bound to fail. No part of the human body can be detached and treated as separate from the organism as a whole. This danger threatens all the forms of physical therapy. It was no doubt enthusiasm for a single method that caused an editorial writer in the official organ of electrotherapy to say that "physical therapy will ultimately be recognized as of greater value than all other therapeutic methods." This concentration on an "all or nothing" policy in the treatment of disease must inevitably lead to preposterous and exaggerated claims, and ultimately to the detriment of scientific practice. Physicians have watched the inroads made on the practice of medicine as a single science. They have noted the attempts of optometrists to parcel off the eye as their particular field; of cosmeticians to assume the right to treat disorders of the skin and to request legislatures to grant them power to remove moles, warts, tumors and other excrescences; of chiropodists to assign to themselves the complete care of the feet; of chiropractors and osteopaths to make the field of manual manipulation their exclusive purview; and of some of the specialists within the ranks of medicine itself to assign all important functions to the teeth, to the lungs or to other organs of the body. The time has come to call a halt on geographic warfare within the human body, and to look on it as a "united states" that will be at least as firmly consolidated as the forty-eight individual constituents of our government.

If electrotherapy could point to a past that was free from the faults that have marred the progress of drug therapy since the earliest times, it would need no caution as to the future. But what has become of the hundreds of galvanic apparatus that struck amazement to the heart of trembling children led into physicians' offices some twenty-five years ago? Where are the little electric batteries that formerly occupied the showcases in the drugstores? Indeed, what has become of the claims for high voltage roentgen ray in the removal of deep seated malignancy? What a brief period it required for these claims, vaunted as the last word in the control of cancer, to resolve themselves into a method used only in apparently hopeless cases! The judgment may be premature, but it is based on scientific studies made in well recognized institutions for the study of human diseases.

PHYSICAL THERAPY PROMOTION

There was a time when the medical scientist, having completed his education in the field to which he wished to devote himself, opened his office, began teaching in a medical school with which he had affiliated himself, undertook the care of patients in legitimate hospitals, and left it to the recognition of the public to advance him to the limit of his merits. Today, modern high-powered business methods applied to the practice of medicine have pointed the way to the cults and to the hyperenthusiastic practitioner for promotion of his particular plans. All the forces of publicity are directed toward urging on the public the peculiar advantages that are claimed to accrue to single methods. The high priest of the peculiar system does not hesitate to instruct his followers in promotion of the system by all the arts and crafts—mostly the crafts—of salesmanship. There are physical therapists who believe that "high frequency" means the treatment of eighty patients a day. Again, organizations are established, not for study and investigation or for the promotion of knowledge in relation to the growth of any department of medical science, but primarily for the securing of public acclaim through the organization, rather than through the individual. The multiplicity of medical organizations is evidence of the fact that in some instances they are not established with investigation and study as their main objects. Consider in this connection the society called the Association for Medico-Physical Research. In its meeting, one program is devoted entirely to the claims of the now discredited Abrams method; another, to the exploitation of methods for the treatment of cancer, not one of which is established on any sort of a sound foundation; and still others to the promotion of systems of practice that should meet with nothing but the scorn of all who consider themselves honest and ethical practitioners of medicine. One finds here names of men known as faddists, who have discarded scientific rationality. One, without regard to the established facts of science, insists that a rice diet will prevent and cure cancer. Another promotes the treatment of cancer with a serum, regardless of the fact that carefully made investigations have revealed the failure of his method. There is G. E. Harter of the Defensive Diet League of America, who has collected a lot of miscellaneous aphorisms and peculiar concepts concerning food into a system and who has inveigled dentists of this country to his support with the idea that it is the duty of the dentists to establish the food habits of the nation. Among this miscellaneous crew of peculiar faddists appear the names of some physicians whose places on the program apparently represent an attempt to camouflage, with a sort of medical aristocracy, the fallacies that occupy the major portion of the program.

BASIS OF PHYSICAL THERAPY

The results of physical therapy seem to depend on many factors. Without doubt, rays of light have many and varying effects on the human body. Attempts have been made to separate them into effects of the light itself on the tissues and into chemical effects. Electricity has the power of acting through the heat that may be produced and, perhaps, through some effects produced by the current itself not yet determined; indeed, the mechanism is no better determined than is that of immunity in general. Electric stimulation no doubt has the power to act on nerves and on muscles, producing visible motive effects; and with such effects come mechanical changes. Is it not time that intensive study be applied in an analytic manner to determine to just what extent the benefits observed from the various electrotherapeutic measures are due to physical changes in the tissues, to mechanical changes

in the tissues, to the power of suggestion, and, perhaps, to other factors of which we know nothing? Until some adequate basis on which the methods may rest is determined, no one can call such methods truly scientific. We have in physical therapy various methods of producing heat in the human body. There is the heat produced by friction; the heat produced by the external application of light, of hot water or of other heat-producing methods; and the heat produced within the body by diathermy, by the direct injection of heating material, or by the use of methods that will draw unusual quantities of blood to a certain point. In the evaluation of any form of physical therapy, who shall say to what extent the thermic factor alone is responsible and how far the other factors that have been mentioned have a part to play?

The numerous devices for effecting the production of heat, external or internal, for the body unquestionably vary in their potency and in their mechanism. How is the individual physician who knows little or nothing of the physical basis of electricity and, in fact, who knows little or nothing of any physics at all, except in the use of the term as it applies to castor oil and cascara, to have any actual knowledge of these so-called modalities? If the situation that confronted the American Medical Association before the establishment of the Council on Pharmacy and Chemistry was confusion, that of physical therapy resembles almost chaos. Drug products were compounds of chemical substances that might easily be separated into their individual ingredients. Scientific pharmacy had already made sufficient progress to warrant the statement that these ingredients would or would not do what was claimed for them. But when one is confronted with a large box beautifully trimmed with nickel plate and glass, the interior of which is a mass of wiring, spools, coils, gages, screws, nuts and whatnot, and is told that, properly applied, this apparatus will cure pneumonia, neuritis, lumbago, eczema, dysmenorrhea, falling of the uterus and falling of the palate, who is to tell one whether or not the machine will actually do all that is claimed for it? When the textbooks in the field of physical therapy tell the physician that the spine of the patient with locomotor ataxia may be restored to its pristine glory by running a few shocks up and down from the cervical region to the coccyx, is he to discard the prognosis that he has made in the past and to tell the friends and relatives of the victim of the wiles of Venus that his lapse from virtue is to have no further evil effects? What is the physician to do when he learns that most of the textbooks in this field are the products of men who are employed by concerns selling apparatus; when he is constantly besieged with lecture courses paid for by those who have something to sell; when his office is inundated with literature telling him that his financial future depends on the purchase of a vast amount of such machinery? Clearly, a house cleaning is badly needed in this particular field.

At the last annual session of the American Medical Association, held in Atlantic City, the House of Delegates, at the request of numerous members of the profession, voted the establishment of a Council on Physical Therapy, consisting of chemists, physicists, physiologists, pathologists and clinicians, who are to evaluate the actual worth of physiotherapeutic apparatus and methods, and to keep the medical public informed by regular statements of the actual truth or fallacy of such claims. At the meeting of the Board of Trustees held in Chicago early this month, a tentative list of membership for such a council was drawn up. It includes men who are leaders in the field of scientific medicine and in the specialties that have been mentioned, and representatives of the greatest universities and institutions for research in physics and physical therapy that exist in this country. Practically all of these men have volunteered to serve without a cent of compensation in order to give the medical profession unbiased and scientific statements concerning the physical therapy field. Their labors, as have been intimated, will be like the attempts of Hercules to clean the Augean stables. And the medical profession may confidently look forward to the time when the path between the vast accumulation of discarded refuse, jumbled wires, rusted hydrotherapeutic apparatus, peculiar tables and benches, worn-out electric bulbs, and other queer therapeutic apparatus, and the path leading by simple and clean methods to honest therapy will be clear. It is significant that the American Electrotherapeutic Association chose of its own accord to ask the American Medical Association for the appointment of such a council; that officers have taken steps to put it clearly on the side of scientific therapeutics, and that in the arrangement of its program they endeavored to secure material representing actual investigation rather than the exploitation of unknown devices or of therapeutic fallacies.

THE DIGESTIVE TRACT AND ENDOCRINE FUNCTION *

BRUCE C. LOCKWOOD, M.D.
DETROIT

The relation existing between various endocrine disorders and gastro-intestinal disturbances is often vaguely referred to in the literature. Unfortunately, much of the discussion deals with the hazy border-land of endocrinology, not frank endocrine disease, and with ill defined gastro-intestinal pathology. Before attributing gastro-intestinal disorders to hypothetic endocrine disturbance or to a certain endocrine constitution, we must determine whether there are typical or fairly uniform gastro-intestinal findings in typical, frank endocrine disease. If there are, we can assume that, at times, altered alimentary function may be due to slighter disorders in these glands.

This report is a clinical investigation based on a study of the gastro-intestinal tract of most of the frank endocrine cases, involving the thyroid, pituitary and suprarenal glands, which have come under my observation during the last few years.

THE THYROID

Hyperthyroidism.—The literature reveals contradictory opinions as to the effect of excessive thyroid secretion on the gastro-intestinal tract and the incidence of gastro-intestinal symptoms in hyperthyroidism.

Sajous [1] states that excessive thyroid secretion causes excessive metabolism in the gastro-intestinal mucous membrane and muscles, with increased secretion and motor activity, manifested by hyperchlorhydria, gastrosuccorrhea, frequent vomiting, diarrhea and serous light colored stools. One is led to believe that these

* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Sajous, C. E. D., in Tice: Practice of Medicine, Hagerstown, Md. 13: 237, 1924.

are more or less constant findings. Barker [2] states that in exophthalmic goiter the gastric secretion, as a rule, is diminished, but that there are certain cases in which it is increased, and that vomiting and unmotive diarrhea are not uncommon. King [3] reports increased stomach and intestinal motility, with an achlorhydria in exophthalmic goiter.

Wolpe [4] found achylia constant in all cases of pronounced types of exophthalmic goiter, but the hydrochloric acid unchanged in other types of hyperthyroidism.

Boenheim [5] states that after injections of thyroid extract the secretion of the stomach is raised. Leist [6] found that in eight cases of exophthalmic goiter, seven showed achlorhydria, and explains the finding on the basis of a subnormal protein content of the blood serum, rather than of a hormonic action.

Crotti [7] often found the stomach of exophthalmic goiter patients to be in a state of constant spasticity, when observed fluoroscopically.

Hardt [8] found that feeding dogs for two weeks with large doses of thyroid extract did not produce gastro-intestinal symptoms, but that the digestive acidity and secretion was slightly reduced. On the other hand, Rogers and his associates [9] found that on dogs with a Pawlow pouch the injection of extracts of the non-coagulable portion of the thyroid acted as a vigorous stimulant to gastric secretion.

Hammett and Tokuda [10] found that solutions of thyroxin in sodium hydroxid caused no more contraction of intestinal segments than did sodium hydroxid alone. Friedman [11] explains the various findings in hyperthyroidism on the basis of individual vagotonia and sympatheticotonia, while Boothby [12] believes that this grouping, as advanced by Eppenger and Hess, is not in accordance with the best experimental and clinical evidence.

The incidence of diarrhea in hyperthyroidism is variously given as from 11 to 75 per cent. of cases. Many of the data available are inaccurate, owing to the fact that only in recent years, since the more common use of the basal metabolism apparatus, have the early or milder cases been recognized.

Clinical Observation: Our study is based on a total of ninety cases of definite hyperthyroidism, a number of which were studied in association with Dr. Hugo A. Freund. These cases are divided into three groups, according to the types of goiter; namely, the formes frustes, the exophthalmic and the adenomatous types. The gastro-intestinal findings and their incidence are considered from the standpoint of the symptoms and the diagnosis.

Out of a total of ninety cases, with an average metabolic rate of + 35, twenty-four, or 36.6 per cent., showed some gastro-intestinal complaint. Nausea and vomiting, which are usually considered common complaints, were present in only three cases, or 3.3 per cent. of the total. Diarrhea, which is again considered common, was present in only four cases, or 4.4 per cent. of the total. These cases all occurred in the exophthalmic type, and constituted 16 per cent. of the cases in which such a diagnosis was made. Moderate or severe constipation was present in 16.6 per cent. and was about equally divided among the three types of goiter. Visible mucus in the stool occurred in eight cases. Jaundice occurred in one case of exophthalmic goiter, and was followed by immediate improvement in the hyperthyroidism.

Gastric analysis was done only in those cases presenting digestive symptoms. One achlorhydria was found in five formes frustes cases. It was found seven times in ten exophthalmic cases, and twice in nine adenomatous cases.

In Table 1 are tabulated the findings showing the incidence, symptoms and gastro-intestinal diagnosis in these ninety hyperthyroid cases.

TABLE 1.—*Incidence of Gastro-Intestinal Disease in Ninety Cases of Hyperthyroidism*

	Formes Frustes	Exophthalmic	Adenoma	Total No.	Total %
Number of cases studied	22	25	43	90	....
Average basal metabolic rate	+25	+48	+32	+35	....
Number having digestive symptoms	5	10	9	24	36.6
Symptoms					
Appetite poor	3	5	8	15	16.6
Nausea or vomiting	0	2	1	3	3.3
Gastric distress or pain after meals	1	1	1	3	....
Colonic distress or pain related to bowel movements	2	3	2	7	....
Constipation, moderate or severe	4	5	6	15	16.6
Diarrhea	0	4	0	4	4.4
Mucus in stool	2	4	2	8	8.8
Jaundice	1	0	0	1	....
Free hydrochloric acid absent	1	7	2	10	....
Free hydrochloric acid low	1	1	1	3	....
Free hydrochloric acid normal	3	2	6	11	....
Diagnosis					
Achylia gastrica	1	7	2	10	....
Peptic ulcer	1	0	1	2	....
Gallstones	0	0	1	1	....
Chronic intestinal stasis	4	6	5	15	....
Chronic appendicitis	1	0	1	2	....
Cecal stasis with spastic transverse colon	3	4	3	10	....
Catarrhal colitis	1	3	0	4	....
Mucous colitis	1	1	0	2	....

Comment: Nothing unusual is revealed by our study, except perhaps the low incidence of vomiting and diarrhea, which generally occurs only in the very severe cases of exophthalmic goiter. Achlorhydria occurred in ten of the twenty-four cases in which gastric analysis was done (41.6 per cent.), and was present more often in the severe cases. This suggests a tendency toward a diminution rather than an increase of gastric secretion in hyperthyroidism. Constipation, especially cecal stasis and irregular spastic haustration of the transverse colon, was rather common in the milder cases of the hyperplastic type. The incidence of other gastro-intestinal findings was perhaps not greater than among an equal number of persons not showing hyperthyroidism.

Hypothyroidism.—The literature is rather scanty concerning digestive tract study on cases of myxedema. This is probably due to the fact that myxedema patients seldom have abdominal complaints, except constipation. Sajous [1] states that in cretinism and myxedema the stomach does not appear to be the seat of disorder more frequently than in the cases of normal subjects. Sturgis [13] reports the gastric analysis in five cases of myxedema, of which three showed achylia, one a low acid and one normal acid. Katz [14] reports several cases

2. Barker, L. F.: Tr. Am. Gastro-Enterol. A., May 7, 1918.
3. King, J. H.: M. Clin. N. Am. **2**: 1655 (May) 1919.
4. Wolpe: Hospitalstidende **62**: 1914.
5. Boenheim, F.: Deutsch. med. Wchnschr. **47**: 1256 (Oct. 20) 1921.
6. Leist, M.: Wien. Arch. f. inn. Med. **2**: 491 (June 30) 1921; abstr., J. A. M. A. **77**: 742 (Aug. 27) 1921.
7. Crotti, André: Thyroid and Thymus, Philadelphia, Lea & Febiger, 1918.
8. Hardt, L. L. J.: Am. J. Physiol. **40**: 314 (April) 1916.
9. Rogers, J.; Rahe, J. M., and Abrahamson: Am. J. Physiol. **48**: 79 (Feb.) 1919.
10. Hammett, F. S., and Tokuda, K.: Am. J. Physiol. **56**: 380 (July) 1921.
11. Friedman, G. A.: Peptic Ulcer, J. A. M. A. **71**: 1543 (Nov. 9) 1918.
12. Boothby: Oxford Medicine **3**: 915.
13. Sturgis, C. C.: M. Clin. N. Am. **5**: 1251 (March) 1922.
14. Katz, J.: M. Rec. **97**: 916 (May 29) 1920.

of hyperacidity in myxedema cured by thyroid extract, also some ulcer cases helped by thyroid administration.

Experimentally, Friedman[11] and Carlson and Jacobson[15] found gastroduodenal ulceration in about 75 per cent. of thyroidectomized dogs.

Clinical Observation: Ten cases of hypothyroidism have been studied. All showed a low basal metabolic rate, with varying degrees of myxedema, typical fat deposit distribution, and improvement under thyroid therapy.

The outstanding feature of the gastro-intestinal findings was the incidence of achlorhydria, which was present in 60 per cent. of these ten cases. Seven patients had constipation, and showed varying degrees of intestinal stasis with the roentgen ray. In one case the constipation was interrupted by an occasional outburst of diarrhea. Duodenal ulcer and chronic appendicitis were each diagnosed once.

Table 2 gives a summary of the findings in these ten cases of hypothyroidism.

TABLE 2.—*Gastro-Intestinal Tract Findings in Ten Cases of Hypothyroidism*

Patient	Basal Metabolic Rate	Gastro-Intestinal Symptoms	Gastric Acidity	Roentgen-Ray Findings
1	−13	Ulcer syndrome; constipation	F. 25 T. 35	Duodenal ulcer
2	−15	Constipation	F. 0 T. 37	Marked rectal and general colon stasis
3	−18	Moderate constipation; enteroptosis	F. 0 T. 18	Ptosis, cecum and transverse colon; cecal and rectal stasis
4	−18	None	F. 20 T. 40	Not done
5	−20	None	F. 0 T. 20	Not done
6	−28	Severe constipation; pain, right first quadrant	F. 0 T. 10	Cecal stasis; chronic appendicitis
7	−15	None	F. 35 T. 50	Not done
8	−18	Pain in lower abdomen; constipation; pelvic inflammatory disease	F. 15 T. 25	Cecal stasis; rectal stasis
9	−35	Constipation alternating with diarrhea; mucus in stool at intervals	F. 0 T. 12	Negative
10	−15	Moderate constipation	F. 0 T. 35	General colonic stasis

venously, and a series of roentgenograms was taken during digestion. The results were somewhat variable, but as a rule there was a primary decrease, followed by an increase of the motility of the stomach, while the motility of the small and large intestine was generally unaffected.

15. Quoted by Barker (Footnote 2).
16. Galán, J. C.: Rev. de la Asoc. Méd. Argentina **34**: 20, 1921; abstr., J. A. M. A. **77**: 306 (July 23) 1921.
17. Ginsburg, Harry; and Tumpowsky, Isidor: Control of Hunger by Drugs, Arch. Int. Med. **22**: 553 (Nov.) 1918.

THE PITUITARY

Beyer and Peter, in 1900, found that injections of pituitary extract at first gave a diminution, then shortly a marked increase, of rhythm and tone of the intestines. Bell, in 1909, called attention to the power possessed by pituitary gland extract to restore peristalsis to the paralytically distended bowel. Galán[16] found that hypophysial extract has an exciting action on the tonus and contraction of the stomach, both isolated and in situ. However, Ginsberg and Tumpowsky[17] found that 1 c.c. of pituitary extract caused an immediate inhibition of hunger contractions, lasting from one to two hours. Pancoast and Hopkins[15] observed the effect of pituitary extract on the gastro-intestinal tract in eleven patients. Pituitary extract was given intravenously after the injection and followed shortly by a bowel movement.

Regarding the effect of pituitary extract on gastric secretion, Hess and Gundlack found no marked effect. Boenheim[5] observed an increased secretion, while Pal[19] and also Rogers and his associates[9] found a decrease.

The literature reveals little regarding the gastro-intestinal tract in pituitary disease. Englebach and Tierney report three cases of postadolescent bilobar pituitary insufficiency in which the presenting and chief complaint was severe lower abdominal pain, for which no local cause could be found. Blumgarten[20] also refers to cases presenting pituitary characteristics, especially the Frölich or Lorrain-Levy types, in which there are attacks of colicky abdominal pains, nausea and vomiting. He states that these attacks are always preceded by a frontal headache, often associated with blurred vision or dizziness, and often occur with menstruation.

Clinical Observation: Our observations cover six cases of postadolescent bilobar pituitary insufficiency, two cases of diabetes insipidus and two cases of acromegaly.

There were no consistent findings observed in the gastro-intestinal tract that could be attributed to the pituitary hormone. Achlorhydria was found in three of six hypopituitary cases, being present in the three showing the most marked hormonic signs. There was a tendency toward spastic manifestations of the colon, evidenced by distress and either constipation or mushy

Englebach and Tierney[18] describe a general and an intestinal reaction following sufficiently large doses of pituitary extract. In treating cases of hypopituitarism the dose of pituitary extract is gradually increased until an intestinal reaction is produced. This consists of intestinal cramps coming from one to two minutes

TABLE 3.—*Findings in Ten Cases Presenting Evidence of Pituitary Gland Disease*

Case	Pituitary Diagnosis	Gastro-Intestinal Symptoms	Gastric Acidity	Roentgen-Ray Findings
1	Marked bilobar, insufficiency due to cystic tumor; necropsy	Moderate constipation	F. Neg. T. 10	Sella enlarged to size of walnut; gastro-intestinal examination not done
2	Moderate bilobar, insufficiency, aneoplastic	Constipation; gas distention and distress, relieved by an enema	F. Neg. T. 30	Sella small, gastro-intestinal examination negative, except spastic transverse colon
3	Moderate bilobar, insufficiency, aneoplastic	Nausea and occasional vomiting; constipation; colon bloating and distress	F. 47 T. 75	Sella small, spastic descending colon
4	Marked bilobar, insufficiency, aneoplastic	Tendency to mushy stools with occasional cramps in lower abdomen	F. Neg. T. 12	Sella very small, size of pea; spastic descending colon, ptosis transverse colon
5	Moderate bilobar, insufficiency, aneoplastic	None	F. 20 T. 30	Sella very small, gastro-intestinal examination negative
6	Moderate bilobar, insufficiency, aneoplastic	None	F. 23 T. 53	Sella small, gastro-intestinal examination not done
7	Diabetes insipidus	None	F. 15 T. 22	Sella normal, gastro-intestinal examination not done
8	Diabetes insipidus	None	F. 20 T. 50	Not done
9	Acromegaly	None	F. 30 T. 45	Not done
10	Acromegaly	None	F. 25 T. 45	Not done

18. Englebach and Tierney, in Tice: Practice of Medicine **8**: 497, 1924.
19. Pal: Deutsch. med. Wchnschr. **42**: 1030, 1916.
20. Blumgarten A. S.: M. Clin. N. Am. **6**: 687 (Nov.) 1922.

stools. In two cases each of diabetes insipidus and acromegaly, no gastro-intestinal symptoms were present.

The gastro-intestinal findings in these cases of pituitary disease are given in Table 3.

THE SUPRARENALS

Sibelli, in 1909, Finzi, in 1913, Mann, in 1915, and Friedman, in 1916, all found that in 95 per cent. of animals, hemorrhagic gastroduodenal ulceration followed the total removal of both suprarenals. Friedman also produced duodenal lesions in eleven of twelve dogs by administering epinephrin for two weeks. He explains the origin of ulcer on localized muscle and vascular spasm and relaxation, dependent on autonomic control by the thyroid and suprarenal. Mann, in a small series of cases of Addison's disease, witnessed at necropsy only one case of chronic ulcer.

Rogers and his associates found that injections of epinephrin and suprarenal nucleoprotein inhibit gastric secretion. Ginsberg and Tumpowski found that 1 c.c. of 1:10,000 epinephrin caused prompt and marked inhibition of hunger contractions for from one to two hours.

Regarding the lesser or "fruste" forms of suprarenal insufficiency, I have not recognized any cases in which gastro-intestinal manifestations could be attributed to such a cause with any degree of certainty.

COMMENT

The gastro-intestinal tract may be considered as a muscular tube endowed with a normal muscular tone, rhythmicity and irritability. It is essentially an automatic organ like the heart. Its stimuli to movement and secretion arise within itself, but these movements and secretions are also regulated by the action of the extrinsic nerve fibers, so as to adopt them to varying conditions.

The innervation of the digestive tract consists of a system of nerves, ganglions and end-organs, about which very little is definitely known. It is a complicated automatic system, sensitively affected by emotions, reflexes, general states of the body, such as toxemias, and infections, as well as by the daily changes of body functions that take place in health. This system is composed of the sympathetic and the vagus ramifications, together known as the autonomic system. The vagus and the

TABLE 4.—*Findings in Six Cases of Addison's Disease*

Patient	Blood Pressure: Systolic	Blood Pressure: Diastolic	General Symptoms	Gastro-Intestinal Symptoms	Gastric Acidity	Roentgen-Ray Findings
1	100	65	Duration, 6 months; weakness, loss of weight, pigmentation of skin, headache and dizzy spells	Constipation for 10 years; spells of nausea and vomiting, with dizziness	F. 24 T. 65	Not done
2	94	66	Duration, 1 year; weakness; loss of weight, nervousness; pigmentation	Diarrhea, 4 months; intestinal stasis; colonic distress	F. 58 T. 82	Three cycle peristalsis and spastic pyloris; pericecal disease
3	85	60	Duration, 3 years; weakness, pigmentation, tuberculosis of lungs moderately advanced	Constipation; hard scybalous stools; pain in epigastrum relieved by bowel movements	F. 0 T. 21	Cecal stasis; spastic irregularity; haustration transverse and descending colon
4	86	65	Duration, 3 years; weakness, pigmentation, cold extremities, dyspnea	Anorexia, constipation	F. 0 T. 12	Not done
5	105	75	Duration, 1 year; weakness, pigmentation, dizzy spells	Severe gastric hemorrhage 9 months before; no symptoms	F. 18 T. 34	Negative
6	95	70	Duration, 4 years; marked pigmentation, loss of weight, dizzy spells, weakness	Diarrhea spells for 1 year; colonic distress and gas; mucus in stools; no pus	F. 0 T. 25	Spastic descending colon

Loeper describes a number of cases of what he calls "suprarenal dyspepsia," a "fruste" suprarenal insufficiency, characterized by digestive atony and hypochlorhydria, cured by daily injections of epinephrin. On the other hand, Kaplan and Greef present three cases of what they term adrenopathic hyperchlorhydria, and they obtained symptomatic improvement and lowered gastric acidity by giving dried suprarenal by mouth.

It is generally stated that anorexia, nausea and vomiting, intestinal cramps and either constipation or diarrhea are common in Addison's disease; also that gastric acidity tends to become low or absent.

Clinical Observation: We have observed six cases of Addison's disease. All showed some gastro-intestinal manifestation, but no syndrome peculiar to the disease could be determined. Achlorhydria was present in half the cases and in those of longest duration. Ulcer of the stomach was suspected in one case on account of the history of a hemorrhage, but no lesion could be demonstrated by roentgen ray. Nausea and vomiting were present only once, and then they were associated with dizzy spells and were probably of central origin. Severe constipation was found in half the cases, and diarrhea in one third of the six cases. Anorexia was present to some degree in all cases. In Table 4 is a summary of our findings.

sympathetic are assumed to have opposite effects on the gastro-intestinal tract, and to balance normally each other.

The condition of imbalance on the part of these two portions of the autonomic system leads to gastro-intestinal dysfunction. In recent years considerable interest has been manifested in explaining gastro-intestinal pathology and pathologic physiology as being due to autonomic imbalance, which in turn is due to various states of endocrine gland hypersecretion and hyposecretion. That such an explanation may be and often is the correct one is not questioned, yet it seems reasonable to expect more constant gastro-intestinal disturbances in marked and manifest endocrine disorders than is the case.

It must not be forgotten that gastro-intestinal function is influenced by other factors as well as endocrine changes. Indeed, Schnabel[21] found a very small percentage of 350 consecutive gastro-intestinal cases showing endocrine disturbances. Further, it is true that a person of a certain endocrine type, or even having an endocrine disorder, may have gastro-intestinal and other disturbances, dependent on etiologic factors that are not endocrine, and such should be considered in the diagnosis and treatment.

21. Schnabel, T. G.: Pennsylvania M. J. **24**: 229 (Jan.) 1921.

The incidence of gastro-intestinal disturbance in our cases, as previously cited, was less than often considered, and in general occurred in the endocrine cases showing the most marked general bodily changes.

CONCLUSIONS

1. The gastro-intestinal tract shares with the rest of the organs of the body in the secondary effects resulting from disturbances in the functions of the endocrine glands, but not to the extent that is often considered. The exact mechanism is not definitely known, but it is probably through both the medium of the autonomic nervous system and changes in the general bodily nutrition.

2. Slight endocrine disorders seldom produce gastro-intestinal disturbances.

3. In general, the stomach acidity tends to be lowered by hyposecretion of the thyroid, pituitary and suprarenals.

4. Hyperthyroidism also tends to reduce gastric acidity, achlorhydria being a frequent finding in exophthalmic goiter cases presenting gastro-intestinal symptoms.

5. Peptic ulcer is not common in manifest endocrine disease, having been noted only four times in 126 cases.

6. In endocrine cases in which there is intestinal disorder, the most common lesion is spastic rather than atonic.

7. In gastro-intestinal cases, all other etiologic factors should be excluded before incriminating the endocrine glands.

Charlevoix Building.

ABSTRACT OF DISCUSSION

DR. WILLIAM ENGELBACH, St. Louis: The incidence of gastro-intestinal symptoms in endocrines is difficult to determine. It depends on the physician interpreting these cases. The etiology of many of these endocrines is in dispute; various schools have made different groupings. The stage of the disorder and length of time a patient is observed would give a different percentage. A gastro-enterologist might for a few days or months find no endocrine symptoms, yet later symptoms may occur.

I would take issue with Dr. Lockwood regarding his statement that hyperacidity is a constant finding in myxedema. The gastro-intestinal effects in these cases are undoubtedly due to the disturbance of the autonomic nervous system, which is so definitely affected by the internal secretions. For this reason, there is probability that the motility of the gastro-intestinal tract is affected more than its secretions, although these secretions must be decidedly modified at various stages of incretory imbalance. It has been our experience that hyperthyroid individuals most commonly present gastro-intestinal symptoms. Next, we have found that the hypogonadisms, in other words, the castrates, persons with status lymphaticus, and eunuchoids, are most frequently troubled by gastro-intestinal symptoms. The bilobar pituitary disorders, such as Froelich's disease in the postadolescent age, also frequently have very marked gastro-intestinal disturbances. We have not found gastro-intestinal symptoms so frequently present in acromegaly and gigantism, except in those cases due to pituitary neoplasm in which these symptoms are due to intracranial pressure. Our studies made on more than 200 cases, including early and late castrates, eunuchoids, and patients with other primary and secondary gonadal insufficiencies, have revealed that disorder of the generative system has been a most prevalent cause for symptoms referable to the gastro-intestinal system.

In 1918, I reported a case which had been under our observation for five years for persistent vomiting. This woman had had her appendix removed at the onset of the disease, and later an exploratory laparotomy was done without finding the cause for her prolonged vomiting which had produced a very severe emaciation. After the exploratory operation, at which time no intra-abdominal condition was found to account for the nausea and vomiting, she was placed on extract of corpus luteum, which had been placed on the market a short time previously. Following this treatment, she was relieved of all her symptoms except the complete amenorrhea, which had been present for one year previous to her last operation. Since this time, she has been under observation more or less constantly and various other preparations have been given her for recurrences of the anorexia, nausea, vomiting and loss of weight, which usually occur in the order named. No medication other than ovarian preparation given hypodermically has relieved her symptoms.

DR. A. J. CARLSON, Chicago: In the work on dogs referred to by Dr. Park, we took the gastric response to standard meal over a long period to get the average, and then we start the thyroid feeding. We have repeated it over long periods on a number of dogs. It is to be remembered, however, that the dog seems to be more resistant to the effect of thyroid than the human being. Thyroid extract in the dog decreases the gastric secretion, without causing any clear symptom of so-called hyperthyroidism in man, except possibly a slight rise of basal metabolism. I question the actual causal relationship between these so-called hyperthyroids and the cases of disturbed gastric secretion that are reported. Dr. Lockwood spoke of diabetes insipidus and of pituitary injection as throwing light on possible gastro-intestinal disturbances in endocrine disorders. I offer a plea and a protest to the effect that while diabetes insipidus is controlled by the administration of pituitary extract, the evidence is that the cause of the malady is injury to the base of the brain. We have no reliable evidence that pituitary extract is secreted into the blood in any condition.

DR. BRUCE C. LOCKWOOD, Detroit: I did not have time in this paper to include the gonads or disturbances occurring at the menopause. I am aware, as Dr. Carlson has spoken, that diabetes insipidus is now considered as due to a brain injury rather than to an endocrine disturbance; but since it had been so long considered an endocrine disorder I included it in this series.

THE PREVALENCE OF TYPHOID CARRIERS IN A GENERAL POPULATION *

S. W. WELCH, M.D.
SOPHIE A. DEHLER, A.B.
AND
LEON C. HAVENS, M.D.
MONTGOMERY, ALA.

The examination of the general population for typhoid carriers in various localities in the past has disclosed an incidence, where the disease is not unduly prevalent, of from 0.3 to 0.8 per cent.[1] These results are based largely on a single fecal examination. Obviously, the urinary carrier and many intermittent intestinal carriers are missed. The difficulties attendant on the successful demonstration of a typhoid carrier are well known. Not only must fairly large numbers of the bacilli be present in the specimen, but also their numbers diminish very rapidly and any delay in the study of the specimen decreases the chance of a positive result. Repeated examinations of the specimen are therefore useless, and success depends on an immediate single plating of the stool. It is evident, then, that if the rapid diminution of the typhoid organism in the feces could be largely prevented, the labo-

* From the Laboratories of the Alabama State Board of Health, Montgomery, Ala.
* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.
1. Gay, F. P.: Typhoid Fever, New York, p. 124, 1918.

ratory examination would become much more valuable and repeated platings of the specimen could be made with increased chances of success.

The method used in the survey described in this paper prevents in considerable degree the rapid death of the typhoid bacillus in the feces; promotes, on the other hand, its multiplication and prevents, in most specimens, the rapid overgrowth of *B. coli*. This method has been described elsewhere,[2] but certain modifications have been made in the original method, and they are given here.

The basic medium consists of bile, 1 liter; beef extract, 3 gm. and peptone, 10 gm. The reaction is adjusted to p_H 7.2. If the medium is diluted 1:20, the color of the bile does not interfere with the indicator, and phenolsulphonephthalein may be used. The medium is then sterilized at 15 pounds for fifteen minutes. Brilliant green is then added in a concentration suitable to inhibit members of the colon group of organisms and not to prevent the growth of the typhoid bacillus. This should be determined for each lot of the medium by the addition of a small amount (not more than 1 gm.) of fresh feces to 15 c.c. quantities of the bile medium containing brilliant green in varying concentrations. The feces are seeded with small numbers of typhoid bacilli (from 100 to 1,000). The specimens are left at room temperature, and a loopful is plated from the surface of each on successive days. Our experience indicates that the usual concentration of the dye for the purpose lies around 1:1,500, but it is necessary to make this preliminary experiment with each lot of the brilliant green-bile to be sure that it is properly adjusted to prevent overgrowth of the typhoid bacillus with fecal bacteria, and to permit multiplication of *B. typhosus*.

TABLE 1.—*General Results of Survey*

Number of persons examined	1,076
Number of specimens examined	4,950
Number of persons positive (typhoid and paratyphoid A and B)	55
Number of specimens positive (typhoid and paratyphoid)	72
Per cent. of persons positive (typhoid and paratyphoid A and B)	5.1
Per cent. of specimens positive	1.4
Average number of times each person was examined: urine	2.3
Average number of times each person was examined: feces	2.3

The proper concentration of brilliant green having been determined, the dye is added to the bile medium. The container used is a 1 ounce, wide mouth bottle containing about 15 c.c. of brilliant green-bile. The following points are essential to the success of this method:

1. Large amounts of feces will decrease the activity of the dye and permit overgrowth of *B. coli*. Not more than 1 gm. of feces in 15 c.c. quantities of the brilliant green-bile is a satisfactory amount.

2. Incubation of the specimen at body temperature apparently encourages rapid overgrowth with fecal organisms; and, since the typhoid bacillus grows well at ordinary room temperatures, the specimens are not placed in the incubator.

3. Most specimens of bile are well suited to an abundant growth of *B. typhosus*. Occasional lots of bile have been encountered, however, in which the typhoid bacillus fails to grow well. This has been observed with both dehydrated and fresh bile. The addition of beef extract and peptone permits satisfactory growth of the typhoid bacillus, but samples of the medium should be inoculated with *B. typhosus*, both before and after the addition of the dye, to determine its ability to support growth.

For urine cultures, from 5 to 10 c.c. of urine is used. Incidentally, the dye does not interfere with the use of the medium for blood cultures.

2. Hevens, L. C., and Dehler, S. A.: J. Lab. & Clin. Med. **10**: 238 (Dec.) 1924.

LABORATORY EXAMINATION

On receipt of the specimen, Endo plates were streaked with a loopful from the surface of the bottle. This was repeated on the two succeeding days, three platings being made for each specimen. Suspicious colonies were picked to Russell double sugar agar, carbohydrate reactions and agglutination tests being made on cultures from the Russell tubes which gave a characteristic appearance. No culture was considered positive that did not agglutinate in high titer with a known monovalent agglutinating serum of high titer (from 1:10,000 to 1:20,000).

RESULTS

The survey included 1,076 healthy persons employed in the dairy industry of Alabama. There were 1,004 men and seventy-two women. Both feces and urine were obtained from each person an average number of 2.3 times. Table 1 summarizes the results.

Thirty-nine healthy typhoid carriers, thirteen paratyphoid A carriers and three paratyphoid B carriers were found, making a total for both typhoid and paratyphoid of fifty-five, or 5.1 per cent. Three hundred persons in a community where, until a few years ago, a very high typhoid rate existed, yielded thirty-one carriers. If these are excluded from the general survey, there still remain twenty-four carriers of typhoid and paratyphoid among 776 persons, or a rate of 3.1 per cent.

Table 2 shows the distribution of fecal and urinary carriers. The number of urinary carriers is surprisingly high, almost one half of the total, indicating the importance of examining the urine as well as the feces in a search for carriers. The importance of enrichment of the whole specimen of urine, together with an incubation period to permit multiplication of the organisms present in the original specimen, undoubtedly yields a larger number of positive results than direct plating. This preliminary enrichment and incubation is emphasized by Garbat [3] as an important part of the technic of urine examination for typhoid.

The typhoid carrier rate that has been found to exist in certain communities in Alabama is much higher than any previously recorded. This study, however, presents certain differences from those heretofore made. Not only were specimens of urine as well as feces obtained, but repeated examinations were made. An analysis of the positive results shows that thirty-four carriers were found on the first examination. Subsequent examinations resulted in the detection of twenty-one additional carriers who would have been missed had only a single specimen been obtained. Furthermore, it is seen in Table 2 that there were eighteen urinary typhoid and five urinary paratyphoid A carriers. If feces only had been examined these would, of course, have been missed, leaving only eleven carriers, who would have

TABLE 2.—*Incidence of Fecal and Urinary Carriers*

		Per Cent. of Total
Fecal typhoid	21	1.95
Urinary typhoid	18	1.65
Fecal paratyphoid A	8	0.75
Urinary paratyphoid A	5	0.43
Fecal paratyphoid B	3	0.27
Urinary paratyphoid B	0	....
	55	

3. Garbat, A. L.: Monograph 16, Rockefeller Institute for Experimental Medicine, p. 58

been detected by a single examination of the feces, or a rate of 1.0 per cent.

That typhoid carriers in general do not excrete the bacilli in large numbers at all times is indicated by the well known difficulty of obtaining bacteriologic proof of a carrier. Further evidence of this intermittence is offered in Table 3. This table shows the number of examinations, the period covered by the examinations and the specimens that were positive. It further emphasizes the importance of repeated examinations, and illustrates the fact that no definite number of examinations will exclude the possibility of the existence of the carrier condition. In three instances (35, 36 and 37), positive results were not obtained until the sixth examination. Subject 8, a urinary carrier, had three negative examinations before a second positive specimen was obtained.

TABLE 3.—*Positive Carrier Examination*

Carrier No.	Number of Examinations*	Specimens Positive	Time Between First and Last Specimens
1	1	1st	.....
2	3	1st	4 weeks
3	3	1st	4 weeks
4	1	1st	.....
5	1	1st	.....
6	4	1st and 2d	6 months
7	1	1st	.....
8	5	1st and 5th	4 weeks
9	2	2d	4 weeks
10	1	1st	.....
11	5	1st	2 months
12	1	1st	.....
13	2	2d	2 months
14	1	1st	.....
15	1	1st	.....
16	2	2d	10 days
17	8	3d	4 months
18	5	2d	1 month
19	2	2d	1 month
20	5	4th	6 weeks
21	2	2d	1 month
22	3	3d	1 month
23	4	3d	2 months
24	3	1st and 3d	1 month
25	4	3d	2 months
26	4	3d	2 months
27	2	1st	10 days
28	1	1st	.....
29	1	1st	.....
30	1	1st	.....
31	1	1st	.....
32	4	4th	2 months
33	1	1st	.....
34	1	1st	.....
35	10	6th	4 months
36	6	6th	4 months
37	8	6th	4 months
38	4	4th	10 days
39	1	1st	.....
40	1	1st	.....
41	1	1st	.....
42	4	1st	1 week
43	2	2d	6 months
44	1	1st	.....
45	1	1st	.....
46	12	1st	.....
47	1	1st	.....
48	1	1st	.....
49	1	1st	.....
50	1	1st	.....
51	4	2d and 4th	1 week
52	2	2d	1 week
53	1	1st	.....
54	4	1st, 2d and 4th	10 days
55	3	3d	3 weeks

* Both feces and urine.

This high typhoid carrier rate in a general population cannot be given its proper significance until a more complete knowledge of the carrier problem in general has been developed. It is evident that no outbreak can be traced to the majority of these carriers. It must be assumed, for administrative purposes, that every person who harbors bacilli that conform to the cultural and serologic criteria of the typhoid bacillus is a potential disease producer. That such a person actually does cause disease is another question. Personal habits may determine to a considerable degree the effectiveness of a carrier in producing typhoid fever. There are included in our series two urinary carriers, the owners and operators of a dairy, to whom no case of typhoid fever can be attributed over a period of at least five years. These two carriers have been particularly cleanly in their habits, and even though engaged daily in handling milk consumed by others, apparently prevented the infection of their product over this considerable period of time. One of these carriers could give no definite history of an attack of typhoid; the other had had typhoid fever fifteen years before.

It must further be assumed that all these organisms are virulent. Had we a test to determine the virulence of typhoid cultures, it might be found that many typhoid carriers are harboring avirulent bacilli, incapable of disease production.

As the result partly of the difficulty of detecting the typhoid bacillus in the discharges, it is assumed that a healthy carrier is a permanent carrier. It is possible that exposure of immune persons to infection may produce a temporary carrier state more frequently than has been actually supposed. Klinger and Lentz [4] adduce some proof of the existence and temporary nature of so-called contact carriers. Klinger found eleven carriers in the neighborhood of cases of typhoid fever who gave no previous or subsequent history of an attack. In nine of these the bacilli were found on only one occasion. Lentz examined persons in association with typhoid patients and discovered twenty-two carriers. Semple and Greig [4] report the finding of carriers among hospital orderlies in attendance on patients with typhoid.

Regardless of these considerations, it is apparent that many typhoid carriers exist against whom there is no epidemiologic evidence of responsibility for disease production. This high carrier rate in a general population may indicate that a larger proportion of cases become carriers than has previously been supposed. A study of patients who have recovered is now being made in Alabama with this point in view.

SUMMARY

The method described for the collection of specimens of feces and urine for typhoid cultures prevents in a large measure the deterioration in value of such specimens with the lapse of time. A typhoid carrier survey of 1,076 healthy dairy employees yielded fifty-five carriers of typhoid and paratyphoid bacilli, a rate of 5.1 per cent.

519 Dexter Avenue.

ABSTRACT OF DISCUSSION

DR. SENECA EGBERT, Philadelphia: It is agreed that there is a difference between the danger of contagion from the carrier in the city and the carrier in the country. In the city where there are all the conveniences of the home and household, such as good plumbing, and where the discharges of the body go into the common sewer and are later well diluted or treated and no longer dangerous to health, the carrier may not be a menace; but in the country the excreta of the carrier often go to a cesspool and then into the drinking water of the household. I think that the question of household conveniences is a factor in these cases and frequently determines whether a carrier is a serious menace or not.

DR. GEORGE M. KOBER, Washington, D. C.: It was my pleasure to make a tabulation in 1895 of 330 epidemics of milk-borne typhoid fever, scarlet fever, diphtheria, septic sore throat, etc. I am very glad that Dr. Welch has investigated the subject of typhoid carriers in relation to the milk supply.

4. Quoted by Ledingham and Arkwright: The Carrier Problem in Infectious Diseases, London, p. 19, 1912.

I have always felt that after convalescence from typhoid fever we should know more about the percentage of typhoid carriers. I feel that it is highly important that more such surveys should be made. I came to the conclusion in 1895 that the safeguarding of the milk supply was one of the most important sanitary problems. I feel that perhaps the most efficient preventive measure that we as sanitarians can offer to the public at large is by advocating sterilization or pasteurization of all cow's milk. Many physicians are opposed to this on the assumption that heat destroys the vitamins and impairs the digestibility of the milk, but even there we have been assured by experiments that rapidly heated milk does not to a degree affect vitamins and it has been shown by Dr. Schroeder of the Department of Agriculture that heated milk does not impair its digestibility. So on the whole I don't know that we can offer any better advice than to bring up the milk rapidly to the boiling point, or what is commonly called scalding it.

DR. W. H. SEEMANN, New Orleans: I do not know of anything that the rise and fall of the health officer is more largely governed by than his typhoid rate. Day by day we are getting closer to the question of the individual carrier. We do not know what cesspools, water supplies or food supplies may be infected. In this way we have outbreaks. Work must be done with the man who handles foodstuffs, the starting point of an outbreak, and the method Dr. Welch has outlined for rapidly determining the existence or nonexistence of the carrier state seems to me to be a very valuable one. We have been for many years using various inhibiting agents. The big point he has brought out in hunting for typhoid carriers is rapid planting in whatever culture material one may use. In addition, it has been noted that excretion of typhoid bacilli in carriers is not always a constant process, but at times the bacilli will not be found in urine and in the feces, when on another occasion they may be found.

DR. A. J. CHESLEY, Minneapolis: In Minnesota, only two small outbreaks of typhoid have been water-borne since 1914. The division of preventable diseases has systematically followed up epidemiologic indications of carriers since 1913, and to date has discovered 131 carriers responsible for 644 cases, including forty-six fatalities. Mailing outfits with a medium like the one Dr. Welch describes are used for sending specimens of bowel and bladder discharges to the laboratories. The control of typhoid carriers must be carried out without publicity if possible. In cooperation with the state dairy and food department, a program for typhoid carrier supervision was agreed on several years ago. The 131 carriers were discovered through investigation of outbreaks traced to them. Occupation is an important factor in relation to typhoid carriers. Dairy workers, then cooks and food handlers are most dangerous when carriers. What automobile tourist traffic may show remains to be seen; but many people who ordinarily do not handle food prepare it for others while touring. It is often impossible for a dairy farmer or a cook to give up his work and get something that is safe with an income sufficient to support his family. Whenever possible, certain adjustments have been made to permit the sale of cream, separated at the farm, to supervised creameries where it is pasteurized and used for butter making only. Sometimes no adjustment can be made and the carrier suffers serious losses entirely in the interest of public health. The 1925 legislature granted $6,000 a year to be used by the industrial commission at the direction of the state board of health to aid carriers who suffer serious losses. A bill for typhoid carrier relief had been considered at several previous sessions. In 1925 the bill was not passed, but the appropriation was granted. This typhoid carrier appropriation by the legislature I think is a distinct advance in practical typhoid control. Typhoid infection always comes from a patient, a convalescent or a chronic carrier as far as we know. Therefore, when water supplies are properly safeguarded, the epidemiologic search for carrier sources of outbreaks with intensive systematic follow-up of typhoid convalescents should eradicate typhoid fever. And the injustice now done to the carrier and his family may be lessened by state compensation in deserving cases.

DR. A. T. MCCORMACK, Louisville, Ky.: I congratulate Minnesota for recognizing human beings in the same way as dairy cows. This is a real milestone in progress which really indicates that the human being will be considered of some cash value along with other animals for which we are in the habit of paying in money.

DR. S. W. WELCH, Montgomery, Ala.: We have in the last two years organized a movement for the standardization of the milk control methods in Alabama. Some years ago we standardized the control of our municipal water supplies. We concluded that we could now standardize our milk supply, and if we could do this, we would have our principal sources of typhoid fever under control. The work that we have done has given spectacular results. In 1907, when we began this work, we had 989 deaths from typhoid fever in the state. In 1924 there were just a few more than 300. We have no municipal typhoid fever worth mentioning now. We have made some very interesting discoveries. Outbreaks of typhoid fever in rural districts on investigation have practically every one of them been traced to a carrier. We are now conducting an organized campaign against carriers. We have obtained some very startling results along these lines. While admitting that the carrier is the cause of most of the typhoid fever in rural districts, I am not prepared to admit that they are without danger in the city. Our first knowledge of the carrier was Typhoid Mary. Any one who handles food supplies, whether in the city or country, is a potential distributer of typhoid fever. We are examining our food handlers in every capacity in Alabama with a view of eliminating all who proved to be typhoid carriers. The discoveries have sometimes been disconcerting. A man and his wife, who had been conducting a dairy for five years, were found to be carriers and the dairy closed. There seemed to be nothing else to do, although we did not trace typhoid fever to any one who had been supplied with milk from his dairy.

IMMUNITY IN CANCER *

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NEW YORK

For years the fact has been noted that occasionally human carcinoma or sarcoma disappears either spontaneously, after incomplete removal, or in connection with some general processes. Among the latter may be enumerated high and continued fever, or profound alterations in the metabolic processes of the organism, such as cachexia, artificial menopause, or the puerperium. While doubtless many of the older observations are unreliable because of the lack of microscopic tumor diagnosis in the period during which the patients were observed, there are still in the literature some hundreds of examples in which a microscopically verified, morphologically malignant tumor disappeared for a period of years. But during the thirty or forty years that these recessions have been observed to occur, millions of people have been recorded as dying of cancer, so the phenomenon must be extraordinarily infrequent and conclusions as to the underlying causes can scarcely be drawn. According to my experience, tumors resembling sarcomas, but difficult to differentiate microscopically from the granulomas, are the type most likely to regress. The records show that very few typical carcinomas have undergone spontaneous regression for any extended period. A slightly different aspect is seen in very late node or scar recurrences, following chiefly radical mastectomy for carcinoma. These are not very infrequent as late as fifteen years

* From the Institute of Cancer Research, Columbia University.
* Read before the Section on Pathology and Physiology at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

after the operation. A few similar late recurrences have been observed after the removal of malignant growths from other situations. A valuable recent collection of many of the first group can be found in an article by G. L. Rohdenburg.[1]

The fact that some of these regressions were coincident with bacterial infections, especially erysipelas, has led to the attempt to cure cancer by the inoculation of virulent erysipelas germs; but a number of deaths having followed this method, it has long since been abandoned. On the other hand, Coley has for years advocated the therapeutic use of a fluid containing the toxins of the erysipelas streptococcus plus those of *Bacillus prodigiosus*. He has used this in a very large number of cases of sarcoma, having found that it was ineffectual on carcinoma. A certain number of regressions have been reported by Coley and others, but they are small in number compared with the many failures. Evidently the procedure is not an effective remedy.

Many attempts have been made, using the analogy of the potency of bacterial vaccines and antitoxins, to induce immunity against human neoplasms by injecting either antiserums produced by treating an animal with the neoplasm, or by direct inoculation either of the crushed tumor or of a tumor killed by roentgen ray. Neither of these methods has proved effective and the last two are dangerous, as examples are known of massive production of tumor tissue in the unfortunate patient, because some of the cells escaped either complete crushing or destruction from the roentgen ray. None of the vast number of serums, either normal or obtained from cancer patients with a quiescent growth or containing the antibodies produced by some hypothetic cancer germ, have proved of the slightest value, nor has it ever been possible to demonstrate in the body either of human beings or of animals any reaction that can be regarded as a response to an immunizing quality of the tumor cells of a primary growth of whatever nature. Even the successful transplantation of a tumor from one animal into another healthy host of the same species, and the continued growth therein, does not result in any demonstrable antibody, though we do occasionally see such antibody production in the course of transfusion in human beings, when the first injection has gone smoothly but the second from the same donor has produced a serious reaction, often accompanied by extensive hemolysis. Evidently, then, the cells of primary tumors are extremely closely related to the tissues of the host and, therefore, are neither more nor less susceptible to the influence of the processes of immunization than the homologous tissues of the body.

If the cause of such spontaneous disappearances cannot be traced to the action of the host on the tumor cells, are there any other facts that may explain the phenomena? The poor vascularity of many malignant growths, and the thrombosis that often occurs in the vessels of a tumor, not infrequently give rise to extensive necrosis, to resorption of the necrotic material and thus to a clinical regression. Such clinical regressions, however, are usually followed in due time by a fresh outburst of the tumor, which then runs its usual course.[2] When, however, scarring occurs about the neoplasm, the return may be delayed for a long period. This is best seen in the very late returns observed after the caustic cure of squamous cell epitheliomas of the face and lip, for recurrence may be very slow. In some instances, years may elapse. The low malignancy of many tumors in the aged is another evidence that with lowered metabolic activity the tumor growth may be slow but is not inhibited. For if there were such inhibition, tumors would not be more frequent in the old than in the young.

The interest in the subject of tumor regression has been greatly stimulated of late by the active research on the general biology of cancer that has been carried on in various laboratories and by an attempt to find out the method of action of radiation on the cell.

For a long time after the introduction of the roentgen ray and radium as therapeutic agents, such effects as were produced on malignant structures were regarded as a direct action of the rays themselves, and the surrounding normal tissues were considered to play, so to speak, a neutral part in the process, though the earliest observers noted that lesions were frequent in the terminal arterioles and much connective tissue sclerosis present. These arterial changes diminish the nutrition of the tissue so affected, and thus cut down to a certain extent the supply of food to the cancer cells contained in such sclerotic tissue. But this, while very important in the primary reduction in the size of tumors, does not destroy all the cells of a growth, and it has been generally accepted as purely a secondary process and has not been regarded as exerting any destructive action against the cancer cells. In recent years, however, especially since the fact has been observed that animal tumors require exceedingly large doses of radiation to kill all the cells, and since a considerable amount of human pathologic material has been examined showing that even with a clinical cure, apparently viable tumor cells remain in the tissues for long periods, the hypothesis has been favored that a large part of the action of radiation is indirect; that the cancer cells are merely damaged, and the destruction completed by some sort of activity on the part of the surrounding tissues. It is impossible to record, within the limits of a paper of this type, a complete summary of the different ideas that have been held by various workers, both laboratory and clinical. Only the most important contributions can be included. But the question is so fundamental to the intelligent application of radiation methods in the treatment of cancer, and the interest in the results of these is so universal, that a survey may be useful.

The question is, then, What is the mode of action of the rays of radiation on the cell? Is it a direct destruction, or is it in part direct action and part a stirring up of the protective agencies of the body such as come into play, for example, in the bacterial infections; or may such results as are observed be wholly due to such protective agencies?

In the first enthusiasm for radiation therapy, the question of anything but direct destruction was not considered. But when those employing these agencies recognized that there were extensive limitations to the curative capacities of irradiation, and when it was shown by myself and verified by others that animal tumors when irradiated inside or outside of the body required very heavy dosage to kill all the cells, those who believed that they could cure cancer added the new hypothesis that the body had some destructive

1. Rohdenburg, G. L.: Fluctuations in the Growth Energy of Malignant Tumors in Man, with Especial Reference to Spontaneous Recession, J. Cancer Res. **3**: 193 (April) 1918.

2. An interesting experimental study of this phase of the subject is given by Woglom, W. H.: J. Cancer Res. **7**: 283 (Oct.) 1923; Réactions générales et locales de l'organisme à l'égard du cancer, Congrès du Cancer, Assn. Franç. pour l'etude du cancer, July, 1923, p. 118.

capacity which aided the direct action of the radiation and destroyed such cells as had not been killed by direct action. A very active study of the question immediately began and assumed two forms: the laboratory experimental work on primary and transplanted tumors in animals, and careful clinical and histologic investigation of the results of irradiation on human tumors.

STUDIES ON ANIMAL TUMORS

One of the first to study the conditions surrounding the spontaneous disappearance of animal tumors was da Fano, who published reports of very careful histologic investigations showing that such regressing tumors were often, though not always, surrounded by a dense infiltration of lymphocytes and plasma cells. He drew the very cautious conclusion that there was some correlation between the presence of these cells and the disappearance of the tumor. This was later taken up by Murphy and his co-workers on a very large scale at the Rockefeller Institute. They published a series of papers containing many ingenious methods of investigation of the problem. They worked, however, chiefly with one tumor, known as Bashford 63. It is not altogether a satisfactory tumor for this work, as it takes irregularly, sometimes 100, sometimes 90, sometimes 80 per cent., and also disappears spontaneously in an unpredictable proportion and often leaves the animal immune. Sometimes the disappearances may amount to 50 per cent. of the inoculated tumors; at other times to less. The use of such a variable tumor—and these variations cannot be removed by the use of a pure bred stock—makes it very difficult to draw definite conclusions unless the effect of these variations is removed by the use of a very large series of animals for each experiment. The conclusions drawn from such experiments cannot be transferred to other transplantable animal tumors, nor can they in any way be considered as warranting conclusions concerning primary human tumors, because the latter practically do not disappear spontaneously. Murphy found that irradiating animals caused a general and local lymphocytosis, and that after such a lymphocytosis was induced a resistance to tumor implantation could be demonstrated. Assuming, for purposes of discussion, that the results of all of Murphy's experiments are correct, in order that the facts so obtained may be generally applicable they must first be verified on other animal tumors. The following work was done in this line at the Institute of Cancer Research of Columbia University.[3] I quote the following conclusions from that paper:

1. Assuming that the lymphocytes carry protective substances, mice or rats with lymphatic leukemia or very high leukocyte counts, 20,000 to 30,000, should show some immunity to tumors. This is not the case with a number of animal tumors, including Sarcoma 180, the Flexner-Jobling rat carcinoma, and incidentally was not observed in the case of human lymphocytic leukemia with a carcinoma of the cervix. The growth progressed at its usual rate and the patient died. Neither Sittenfield nor Kelling was able to show that an artificial lymphocytosis had any effect on tumor growth.

2. If grafts of normal tissues are destroyed by lymphocytes, a preliminary reduction of the total leukocyte count, especially by means of x-rays or radium, should result in a greater number of takes. This we have not been able to demonstrate, even when many hundreds of grafted animals and controls were used. The thyroid gland was the organ used for the grafting.

3. In this same connection it was important to determine whether a tumor of very low growth potentiality could be influenced by the destruction of the lymphocytes. Such a tumor is a guinea-pig fibrosarcoma now being transplanted in the Crocker Fund laboratory. The percentage of takes in this tumor is very small. The animals were x-rayed previous to and following the inoculation of the tumor, the site of the growth being protected by lead. No increase in the number of takes was observed.

4. The effect of the reduction of the lymphocytes in the circulating blood on the rate of take of tumors was studied, first with standard transplantable tumors, second with primary tumors inoculated into a series of animals, half of which were rayed, the raying being either light or very heavy. Not the slightest difference could be observed over a considerable series of experiments between the rayed and the unrayed animals.

5. Finally, the raying of *rats* in which a highly virulent *mouse* tumor had been implanted did not prolong the life of the tumor.

It is therefore evident that the lymphocyte is in no way correlated with cancer immunity.

Opitz at first thought he had demonstrated immunizing effects by irradiating the whole animal with small doses, but in his last paper shows that they were not constant.

Caspari [4] has also attempted to demonstrate the conditions that underlie the disappearance of inoculated tumors. He believes that the death of the tumor cells sets free a nonspecific substance which he calls a necrohormone, which interferes with the further growth of the tumor; but he fully realizes the complications that underly the study of the situation and that no specific antibody like those which are developed against bacteria plays any part in the tumor immunity. Regaud also believes that a toxic substance is set free in the tissues which has a lethal effect on the tumor cells.

Mottram and Russ [5] believe that irradiation incites an immunity, but they used the Jensen rat sarcoma, which is a very variable tumor, often disappearing spontaneously in a high percentage of untreated animals.

Baensch [6] does not agree with Opitz that there is an action of roentgen rays on the vegetative nervous system and through this an unfavorable effect on carcinoma. That writer was also unable to confirm in human beings Opitz' experiments on mouse tumors which receded when the tumors were protected from the roentgen rays and the rest of the animal was irradiated. On the contrary, when a malignant tumor in man was covered and the surrounding tissue—for example, the entire thorax—was irradiated with moderate or large dosage, not the slightest effect was observed.

Kok [7] has recently summed up his work with Vorländer. The effect of irradiation over the entire animal is most effective when it is carried out from two to three days after the tumor has been grafted. After the tumor has definitely begun to grow, the animal must receive at least one third of an erythema dose over the entire body to have any effect. This is a larger amount than can be given to a human being. His observations point to the fact, which has long been known, that grafts do not take well in animals that are sick, and

3. Wood, F. C.: Tr. A. Am. Phys. **33**: 128, 1918.

4. Caspari: Ztschr. f. Krebsforsch. **19**: 74, 1923; **22**: 131, 1924.

5. The references for many of the papers by these authors and others to whom no direct reference has been made will be found in a review of the whole subject by Loeb, Leo: J. Cancer Res. **7**: 229 (Oct.) 1922. Complete references to the literature up to 1913 will be found in Woglom: The Study of Experimental Cancer, New York, 1913. References to the recent German and French literature on the subject will be found in papers by Opitz and Prym: Lehrbuch der Strahlentherapie, Berlin **1**: 875, 1925, and Handbuch der Röntgentherapie, Leipzig **3**: 181, 1924.

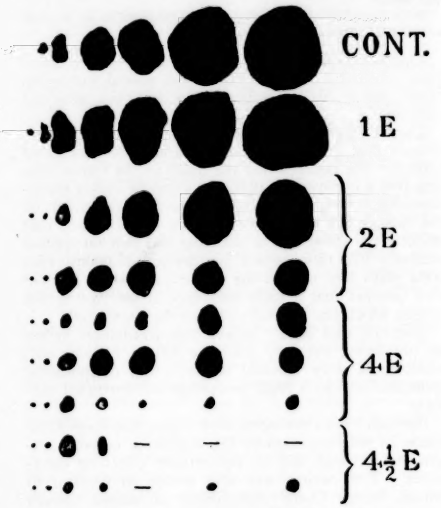
6. Baensch: Strahlentherapie **18**: 519, 1924.

7. Kok, F.: Deutsch. med. Wchnschr. **50**: 298 (March 7) 1924.

such failure to take is not, therefore, a definite proof of a specific roentgen-ray effect, but only shows the animal to be damaged by the irradiation.

Keysser,[8] influenced by Seitz and Wintz' theory of a "carcinoma dose," irradiated a large number of animals with transplanted tumors and made the remarkable discovery that either the animal tumors have an entirely different biologic susceptibility to roentgen rays than the assumption of Seitz and Wintz concerning human cancer warrants, or that his dosage computations were incorrect, or that the action of the rays on the tumor cells must be an entirely indirect one. As Wintz has recently retracted his "carcinoma dose," saying that he never meant by a "carcinoma dose" that it was a dose that would cure cancer, but was merely a maximum which could be given to a cancer without danger to the patient, it is evident that the human tumors are not so different from the mouse tumors in their susceptibility. The second possibility, that the computations of his dosages were incorrect, may or may not be valid. Recent studies of the erythema dose of the various German clinics have shown that it varies as much as 350 per cent. Keysser rather leans to the explanation that there is a general protective reaction of the body which causes a destruction of the tumor.

In further experiments he irradiated tumors in the animals, removed them immediately, and transplanted them. These transplanted tumors grew. But if the tumors were left in the animal's tissues for ten days and then transplanted, he obtained no takes. From this he drew the conclusion that the direct action is unimportant, and that the secondary action of the tissues, which occurs in the period during which the tumor remains in the body, is the important thing. Unfortunately this experiment is not conclusive, for at the end of ten days the destructive effect of the rays on the tumor cells has reached its maximum. If the tumor particle is then transplanted it is already a highly damaged tissue. The transplanting adds fresh trauma. As is well known, most of the cells in the grafts die and the take occurs from only a few remaining cells. It is probable, therefore, that in Keysser's experiment the explanation of a nontaking of the graft which remained ten days in the animal is that the damaged condition of the cells is responsible for the nontaking, rather than in a hypothetic destructive action of the surrounding tissues. For, if the graft, as my own experiments show, is given a sublethal dose, and instead of being transplanted is left in the animal, it will shrink considerably but ultimately recur.



FRC $\frac{120}{C}$ $\frac{121}{A}$ VARYING X-RAY DOSES

Effect of different roentgen-ray doses on the Flexner-Jobling rat carcinoma: All outlines are scaled tracings of the tumor taken one week apart; roentgen-ray treatment was given after the third charting. Top line, untreated control; second line, tumor given one human skin erythema dose; third and fourth line, tumor given two erythema doses; fifth, sixth and seventh lines, tumor given four erythema doses; eighth and ninth lines, effect of four and a half erythema doses, which is about the lethal dose of the tumor. One tumor is killed; the other disappears, but recurs later from a few remaining cells.

Keysser gives no details except that he gave about two erythema doses. This is probably equivalent to three American erythema doses—an amount considerably below the lethal dose of mouse tumors. He apparently does not know whether the mouse tumor he used was capable of inducing immunity against itself—an important point.

I have gone over Keysser's work and get different results. Testing the matter with animal tumors, the following experiment seems to me a crucial one, and I fail to see any logical answer to the necessary conclusions that must be drawn from it. The first requisite was a tumor with a known lethal point to the roentgen ray. Radium is unsatisfactory because of the difficulty of measuring the exact dose reaching the tissue, owing to the rapid falling off of the dose with increasing distance according to the inverse square law, and the irregular form of the container, which requires complicated mathematical computations to give the exact amount.[9] But with a 40 to 50 cm. skin-focus distance and highly filtered roentgen rays, the beam is so nearly homogeneous and parallel when applied to a small tumor that the tissue absorption factor is low.

Take, for example, a series of experiments carried out in the Crocker Institute, using the Flexner-Jobling rat carcinoma. This, as I have shown some eight years ago, is killed at about four and a half erythema doses, all scatter being eliminated, and using the term "erythema" as a very light reddening of the human skin. The German erythema dose is from 50 to 100 per cent. higher than this. The rodent's skin will bear three human erythema doses without damage, but four are apt to produce some burning and epilation. If, now, grafts are planted on the outer surface at the thigh of a series of rats, and after the growth has reached a stable stage and the tumors are from 5 to 10 mm. in diameter they are irradiated, the following phenomena, recorded in the accompanying chart, are to be observed: One human skin erythema dose to the tumor alone produces no change. Even if the animal as a whole is irradiated, the tumor also continues to grow. If two erythema doses are applied to the tumor alone, practically no change in growth rate is noted. With four erythema doses the tumors grow more

8. Keysser, F.: München. med. Wchnschr. **68**: 4 (Jan. 7) 1921.

9. Wood, F. C., and Prime, Frederick: Ann. Surg. **62**: 751, 1915.

slowly, but still progress, and in no case disappear. In other words, if the tumor requires four and a half erythema doses for its destruction in vitro, it requires four and a half erythema doses to be killed in vivo. As a matter of fact, it often requires a little more, because the circulation of the blood through the tumor washes out the destructive products produced by the action of the rays on the cells, and, so to speak, rejuvenates the tissue somewhat. If there is any resistance, protective action or destructive action on the part of the connective or other tissues of the host, any effect on the tumor from the lymphocytes or plasma cells, it would diminish the amount of roentgen ray required to kill the tumor.

Recently we have repeated the work to find whether our animal tumors have changed their lethal dosage. We found that the tumors killed ten years ago with a definite amount of radiation are still killed with the same quantity and exposure in the same time. But in the course of this redetermination we were able to make a large number of experiments of this type. Hundreds of animals with different types of growths have been given one erythema dose to the whole animal, and not a tumor has disappeared; the only ones which have disappeared have been given that full lethal destructive dose required to kill the tumor outside the animal. I cannot see any other way to interpret this experiment but that the body plays no part in the destruction of the tumor by irradiation.

Murphy [10] recently reported a similar roentgen-ray experiment with somewhat different results, but the number of animals was small, the tumor was a primary one whose lethal dose was unknown, and the irradiation was done only ten days after grafting, a period when the tumor is highly susceptible to injury, as its vascular relationships are as yet not thoroughly established. The rays used were the very soft, unfiltered, and the time only 150 seconds. There are many probabilities of error in using such rays at a distance of only 5 to 10 cm. from the tube and for so short a time, and there is no evidence in Murphy's paper that care was taken to eliminate such sources of fluctuation. The most important of these is that the absorption of such soft rays is so great that the proximal surface of a tumor may receive a lethal dose, the cells of the distal portion being practically unharmed. Grafts taken from top or bottom of the tumor may hence give inconstant results. His conclusions, therefore, cannot be accepted as generally valid unless obtained under more accurately controlled conditions, and we have never been able to duplicate them in this laboratory.

Nor do I think that the conclusions of Nakahara [11] in this connection are valid. He irradiated an animal and then implanted tumors in the irradiated areas, and noticed that the tumors did not take in all instances. The number of transplants, however, was small and the tumor used was one with a great variability in the number of takes even when untreated. Having noticed pycnotic and other changes in the nuclei and the formation of monstrous cells, he makes the assumption that, since the morphologic changes in the tumor are those characteristic of the roentgen ray, it is the irradiation of the tissues that has produced the changes in the tumor cells. He does not seem to be aware of the fact that these changes are not at all characteristic of the roentgen ray, and may be produced by any physical agent, such as heat, either by directly warming the tissues in a water-bath, or by diathermy, or freezing of the tumor in the animal, and also by certain chemicals. His descriptions and photomicrographs are merely those of damaged or dying tumor cells. In such experiments, some of the tumors unquestionably die because the connective tissue, after it has been irradiated, does not react to the presence of a graft with the formation of blood vessels as easily as does the uninjured structure. As the fate of a graft depends entirely on its prompt vascularization, as has been shown by Jensen and confirmed by others, the fact that all the grafts did not take is simply more evidence of this fact.

If this experiment is repeated with a tumor of high virulence, like 180, not only does the tumor take in its usual percentage of 95 to 100, but the growth shows no morphologic alterations. The same is true of the Flexner rat carcinoma. Evidently the general conclusions of Nakahara are not warranted from his experiments. All such merely morphologic studies are difficult to interpret. The assumption that, because lymphocytes are present and the connective tissue grows into the receding tumor, the lymphocytes and the connective tissue are the causes of the recession, is an assumption which is no more justified than that cirrhosis of the liver is caused by the choking of the liver cells by the connective tissue that grows in between them. As a matter of fact, no pathologist today would make such a statement, every one knowing that the damage to the liver cells occurs first, and that the fibrosis is merely a replacement. That such cirrhotic fibrosis may compress the portal vein and cause ascites is another question. That is a secondary action, just as the connective tissue which forms through a tumor as the tumor cells disappear may produce a firm scar which shuts off many of the remaining cells from their nutrition, and may ultimately be responsible for the death of a certain number. The cells of a human scirrhous carcinoma of the breast seem to have the capacity to incite abundant growth of connective tissue; yet such a tumor does not cure itself.

We cannot escape from the fact that as far as animal experiments go there has been no proof as yet brought forward that the effect of irradiation on a tumor is anything primarily but a direct effect on the cells. Secondary effects by thrombosis of the vessels are unquestionably important, as the following experiment shows:

If four 1 mg. platinum needles are inserted in a square in an animal or a human tumor at a distance of 1 cm. apart, the tumor tissue between those needles will necrose after from 90 to 100 milligram-hours. The tumor tissue outside the needles will not necrose, unless the time the needles remain is something equivalent to 700 mg. hours, which is the lethal dose of radium with a tube 3 mm. from the tissue with the given filtration, a dose equivalent to five erythema doses to the human skin. Microscopic examination shows quite definitely why the tumor cells between the needles die with a dose insufficient to kill such tumor cells in vitro, and the reason for this is thrombosis of the blood vessels. The reason the tumor cells outside of the area included by the needles do not die is that an insufficient dose has been given to kill the cells directly, these cells being nourished by the large vessels coming from the periphery of the neoplasm.

10. Murphy, J. B.; Maisin, J., and Sturm, E.: J. Exper. Med. **38**: 645 (Nov.) 1923.
11. Nakahara, W.: Histological Study of the Fate of Cancer Grafts Inoculated into an X-Rayed Area, J. Exper. Med. **38**: 309 (Sept.) 1923.

STUDIES ON HUMAN MATERIAL

Ewing, Alter [12] and others have made careful histologic investigations of material removed surgically after radium therapy, and have found much the same histologic pictures of lymphocytic and plasma cell infiltration around receding masses of tumor cells that were observed in the experimental studies on animals, and hence have concluded that this tissue reaction was important in cancer regression of the tumor.

Ewing [13] speaks in no uncertain way concerning the defensive reaction of the body and tissues. In the paragraph cited, he is speaking of the regression of metastatic carcinoma of the testes and embryonal tumors of the ovaries, lymphosarcoma, mixed tumors of the salivary glands, and so forth, and says that when employing less than the killing dose and repeating the exposures at intervals, most of the embryonal and lymphoid tumors react as well as with very heavy doses. "The process leading to these results has certainly not been the direct destruction of tumor cells. . . . It seems more probable that cell autolysis and growth restraint, aided by the natural defense reactions of the body, combined to bring about a gradual regression and eventual disappearance of the tumors." He grants, however, that in the adult type of tumor, such as recurring mammary cancer, uterine and intestinal carcinomas and most osteogenic tumors, external irradiation has been mainly palliative, and that while the life of the patient has been prolonged, the tumor has not been eradicated. He also states that "inasmuch as no form of radiation yields any great success in debilitated or cachectic subjects, it must be evident that radiation therapy relies heavily upon the healthy reaction of the affected tissues and the whole organism."

Again he [14] says:

> The conception of a standard dosage seems to emanate mainly from the notion that radiation cures cancer by killing cancer cells. The idea is an inheritance of the old surgical point of view, that the cancer must be extirpated, root and branch. Thus the experimentalist places a fragment of cancer tissue in a dish, exposes it to radiation, transplants it back into an animal and calculates the killing dose when it fails to grow. This type of experimentation has a definite and somewhat important place, but as an adequate basis of clinical deductions it has seldom escaped criticism when presented before scientific bodies. It has repeatedly been pointed out that such experiments wholly fail to take account of the reaction of the living tissues, which is the main element in the selective cure of cancer by roentgen ray and radium. We are therefore compelled to review our knowledge of the mechanism of the action of these physical agents in causing the regression of cancer.

Alter, on the contrary, believes the connective tissue reaction to be entirely secondary to the destruction of the tumor cells, and only of a reparative nature, taking no active part in the death of the neoplastic structures.

Among recent clinical papers favoring the view of the resisting power of the tissue is one by Drs. Evans and Leucutia.[15] Their conclusions, apparently largely inspired by Murphy's last paper—though clinical observations are also cited—are that there is a beneficial action of roentgen rays in the postoperative stage of mammary carcinoma; that a local tissue reaction is produced by suitable irradiation which brings about immunization against the carcinoma, and that excessive doses will destroy the normal protective tissue about the lesion and aggravate the disease.

On the other hand, many students of the subject have found that even with tumors of the skin viable cancer cells remain in the scar following an apparent cure with irradiation. Operations on patients who have been apparently cured of a malignant growth by irradiation and in whom the growth has been quiescent for a considerable period of years are often disastrous, owing to the rapid recurrence of the growth in the line of incision, so that there is a considerable body of evidence that despite the production of a clinical cure, viable cancer cells remain shut up in the dense scar tissue produced by the radiation. This does not prove that some of the cells may not be killed by the inflammatory reaction which the radiation sets up, but it casts considerable doubt on the effectiveness of the assumed protective agencies. The fact that, as previously stated, metastatic particles of carcinoma may remain in scar tissue or in lymph nodes for many years after the removal of a primary growth of the breast demonstrates that the healthy tissues have but little destructive capacity. The fact brought out by M. B. Schmidt that many cancer emboli do not survive and form metastases in the lung is an entirely different phase of the question. Failure to grow means that the cells are, by the coat of fibrin which surrounds them, mechanically prevented from attaching themselves to the wall of the vessels and thus obtaining the necessary capillary blood supply essential to their growth, and shows also that the respiratory motion of the lungs may play an important part in preventing the same sort of adherence to the vessel wall. Another illustration drawn from the laboratory is seen in the spleen, which is rarely involved by embolic tumor particles. But if a graft is placed directly in the organ, it grows with great facility. In human material, too, it is frequently observed that a tumor—for example, of the pancreas—may involve the spleen by direct extension and grow well in its substance, while, as is well known, embolic involvement of that organ is somewhat rare in man.

Jüngling [16] has brought forward a number of clinical observations which strongly suggest that the action of irradiation is purely a destructive one on the cell, for he has irradiated superficial carcinomas, protecting a portion of the growth by a narrow strip of lead, and then removed sections and examined them microscopically. He has found, for example, that the action on such cells is purely local and that even if a large dose was given which destroyed the cells, a strip of lead only a millimeter or two wide so protected the cells underneath it that they were apparently not damaged.

Jüngling concludes that the action of the roentgen ray on cancer is purely local and that the assumption of destructive action due to inflammatory changes is untenable.

Fischer [17] has made observations similar to those of Jüngling.

Wintz, in discussing Jüngling's paper, says that irradiation in small doses, intended to incite a growth of the connective tissue with an idea of choking the cancer cells, is useless, for the connective tissue has no such power but merely replaces the cancer cells after they are destroyed by the direct action of the roentgen ray.

12. Alter, N. M.: J. M. Res. **40**: 241 (Sept.) 1919; **41**: 439 (May) 1920.
13. Ewing, James: An Analysis of Radiation Therapy and Cancer, the Mütter Lecture, Tr. Coll. Phys., Philadelphia, 1922.
14. Ewing, James: The Mode of Radiation upon Carcinoma, Am. J. Roentgenol. **9**: 334 (June) 1922.
15. Evans, W. A., and Leucutia, T.: Am. J. Roentgenol. **13**: 415 (May) 1925.
16. Jüngling: Fortschr. a. d. Geb. d. Röntgenstrahlen **30**: 101, 1922.
17. Fischer: Strahlentherapie **13**: 13, 1922.

Von Gaza[18] also says there are no observations which point to the fact that mesenchymal cells can attack healthy ectodermal or endodermal cells or their derivatives. The epithelium first must be killed and then may be attacked by mesenchymal phagocytes, and he elsewhere states that it is certain that the most active mesenchymal cells cannot attack healthy living cells such as those of uninjured cancer, and again, that the theory of a successful activation of the mesenchymal tissues against carcinoma without simultaneous severe damage of the tumor cell is without any support from morphologic studies. The only effect which is possible is that the mesenchymal proliferation shuts off the food supply, for example, by vascular lesions, and thus causes the necrosis of the cancer cells.

In a number of articles from the Mayo Clinic by MacCarty and his colleagues,[19] attention has been called to the relation between postoperative longevity and lymphatic infiltration. He says that in a small series of cases which could be thoroughly studied, the presence of extensive lymphatic infiltration by the cells of the tumor was correlated with a longer life, both in carcinoma of the stomach and in carcinoma of the rectum. Additional factors are fibrosis and hyalinization of fibrous tissue. When these are well developed, the prognosis seems to be better. MacCarty is, however, extremely cautious in assuming any causal relationship, and justifiably so, as it is perfectly possible that the lymphatic reaction and the fibrosis are secondary to the presence of a carcinoma, and that they are most abundant in the types which are not highly malignant, and therefore stand in no causal relationship to the extension of life following operation. A reinvestigation of the question by Greenough and myself, using breast tumors, has shown no correlation between longevity and lymphocytosis on this material.

COMMENT

It seems to me that this somewhat lengthy survey of a few of the more important investigations of the question of the capacity of the body to produce immunizing substances against a growing cancer can be decided in only one way, and that is according to the Scotch verdict, "not proven." It is quite possible to explain most of the observed conditions without such an assumption. Late recurrences may be due to alterations in the biology of the tumor cells, and we know from experimental work that different parts of the same tumor may be composed of cells of different malignancy. Cells may remain quiescent in lymph nodes for long periods, probably because the conditions of nutrition are different from the ones to which they are accustomed when living normally surrounded by amply vascularized connective tissue. The mere study of fixed and stained tissue can scarcely bring decisive evidence as to whether the local lymphocytosis and fibrosis is cause or effect. The clinical cures produced by radium and the roentgen ray in which viable cells still remain in the tissues do not necessarily require the assumption of immunity or a destructive action of the connective tissues. They can be explained as easily by another assumption—that the dense scar tissue immobilizes the cancer cells and the great diminution in blood supply prevents their rapid growth. The cells are put, so to speak, in a plaster cast and cannot be massaged about the body by muscular or other movements. When the tissues are incised and a large amount of blood is furnished the cells as healing takes place, they are then capable of renewed growth and the patient dies of a recurrence. I have seen such examples five or six years after apparent healing had been produced. Unquestionably, the cells are considerably damaged by irradiation. After treating animal tumors with sublethal doses of irradiation and transplanting them to a fresh host where there can be no question of immune reaction, the tumors often do not make their appearance for months, a period that corresponds to years in human beings.

With the exception of the experiments which I have outlined, which are represented on the chart, the results of animal experimentation have not been on the whole consistent and permit no conclusions in regard to primary human tumors.

In other words, the permanent cure of a cancer implies the destruction of all the cells of the growth. The body offers no assistance to therapy, and the many cures obtained in situations in which it is impossible that the cancer cells should all be destroyed must have a mechanical explanation and not one based on the assumption of an immunity reaction.

CONCLUSIONS

1. There is no evidence that the very infrequent spontaneous regressions of human tumors are due to any process of immunization.

2. There is also no evidence that the similar spontaneous disappearance of primary animal tumors is due to any process of immunization.

3. The spontaneous regressions, so often observed in transplanted animal tumors, are an entirely different phenomenon. The tumor is a graft into a healthy host and hence is not perfectly adapted to the soil.

4. There is no cogent evidence for, and much against, the conclusion that any process of immunization aids in the therapeutic efficacy of irradiation.

5. Clinical cures can sometimes be obtained by irradiation in situations in which complete tumor cell destruction is impossible but extensive connective tissue sclerosis can be produced, thus locking up any viable cells.

6. The production of absolute permanence of cure by radiation therapy implies that the destruction of the tumor cells must be as complete as must be their removal for effective surgery.

1145 Amsterdam Avenue.

18. Von Gaza, W.: Klin. Wchnschr. **4**: 745 (April 16) 1925.
19. MacCarty, W. C., and Mahle, A. E.: Relation of Differentiation and Lymphocytic Infiltration to Postoperative Longevity in Gastric Carcinoma, J. Lab. & Clin. Med. **6**: 473 (June) 1921. MacCarty, W. C., and Kehrer, J. K. W.: Possible Defensive Factors in Cancer of the Rectum (A Study of One Hundred and Two Cases), ibid. **7**: 603 (July) 1922.

Gastric and Duodenal Ulcer.—The treatment of perforation is becoming standardized. It is agreed on all hands that, whatever is done, the main factor for success is early recognition and early operation. Cases in which operation is performed within twelve hours should not show a higher mortality than 8 per cent., but the mortality advances with giant strides as delay increases. Discussion ranges round two considerations: (1) Whether to do a gastrojejunostomy at the time of the closure of the perforation, and (2) whether to drain. Opinion in England agrees that perforation occurs generally in the chronic ulcer and that in something like 20 per cent. a subsequent operation had to be done for persistence of symptoms of ulcer. Therefore there seems to be a *prima facie* case for some more radical operation than mere closure of the perforation. It must be remembered, however, that some of these perforations are in regions of the stomach where you would not choose gastrojejunostomy as the curative operation, and therefore it is unreasonable to do it just because the ulcer is perforated.—Carson: *Canad. M. A. J.*, September, 1925.

EPITHELIOMA AND THE CHRONIC VARICOSE ULCER*

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In recent years, carcinoma of the extremities has found only a small place in the English surgical literature. This is partially explained by the fact that it is often seen in persons generally otherwise incapacitated, that its diagnosis can frequently be made by inspection, and that it generally necessitates a mutilating operation for its cure.

All these facts apply especially to malignant changes that take place in chronic varicose ulcers, and from the surgical standpoint they are, indeed, mere curiosities. Viewed from the standpoint of the cancer research worker, this material assumes an interest of a large human experiment carried out for years on large numbers of persons with only the very infrequent result that a carcinoma appears; and so unusual is it that one hesitates to consider it as a result of the ulceration.

The epitheliomas, more frequently than other types of malignant disease, seem to be incited to growth by long-continued pathologic processes in the tissues. It would be expected, therefore, that ulcers arising on the basis of varicose veins, characterized by years of neglect and subjected over long periods to the various therapeutic agents believed to stimulate epithelial proliferation, and occurring as they do at the age period when other types of carcinoma show a high incidence, would be not infrequently the starting point for malignancy.

That such is not the case, is certain. The theses that have appeared on the subject are valuable because of the carefulness with which the museums and records of the larger clinics have been searched for instances of this disease with such surprisingly meager results. Nobl,[1] who described the different types of benign ulcers in great detail, states that among 4,000 inmates of the almshouse of Lainz, where about 200 crural ulcers were being treated, only one case of malignancy developing from such an ulcer had been seen. Other large municipal hospitals also furnish rare instances, though it is well known that, among the patients in all surgical clinics, varicose ulcers are numerous.

The recent paper of Grosser,[2] who reported 368 cases of carcinoma of the extremities, mentions only six crural or varicose ulcers not mentioned in the older literature.

The records of St. Luke's Hospital furnish only two instances of epitheliomas so associated with varicosities as to make the latter appear an antecedent condition.

The first patient was a very obese Irish woman, aged 65, admitted to the service of Dr. F. S. Mathews in September, 1917. The history disclosed that a small nodule had appeared many years before on the skin over the middle third of the left tibia. A slight trauma resulted in ulceration, and bleeding with progressive growth of the eroded area proceeded for ten years. The ulcer had been treated in clinics three times a week for the past four months.

The patient exhibited many senile changes and was greatly incapacitated by the pain and infection of the ulcer, though she showed no other symptoms or lesions that could be considered secondary to the malignant condition. The calf of the left leg presented a large excavation on the anterior and lateral surfaces, measuring about 14 by 9 cm. and from 3 to 4 cm. deep. The shaft of the tibia was eroded over a considerable area. The skin edges were sharp, not overhanging, but very much indurated. The base was covered with intensely offensive necrotic material, a few fresh granulations and rather flattened warty masses which were not of the fungating type but fairly solid and possessed the grayish translucent quality suggestive of an epithelial growth. The depth and wide extent of the concavity showed a far greater destructive tendency than usually occurs in an ulcer of a benign type.

The leg was amputated at the knee, and the patient made a slow but satisfactory recovery.

Microscopic sections showed that the growth was of the squamous cell type. The greater portion of the base and margins showed extensive differentiation of cell type with many pearls and broken down keratinized areas, the upper layers of the epithelium predominating. There were areas, however, in which the morphology was quite different and only the large hyperchromatic, undifferentiated epithelial cells were seen infiltrating the tissue spaces in parallel columns. If morphology is of significance, this would indicate the aggressive nature of the tumor; certainly the type of growth was exactly the same as is seen in the lip or mouth tumors (Fig. 1).

The part played by the circulatory factor might be questioned here, except that the tissues of the calf presented the unmistakable results of varicosities in the pigmentation of a bronzed or brownish color and the extensive induration and atrophy of skin and subcutaneous tissues alike. This, with a few visibly thickened and dilated veins, made the vascular condition seem a more prominent feature than the patient had regarded it.

Another case illustrates a second and more frequent type of growth, and one in which the hyperplastic character is very noticeable.

A laundress, aged 66, of Swedish descent, admitted to the service of Dr. H. H. M. Lyle in July, 1919, complained of swelling of the right leg as well as of the ulcer. She had had bilateral varicose veins for nineteen years, and the scars of old ulcers were present on the left calf. Ulceration had occurred on the right leg not more than four months previous to admission. The growth had progressed rapidly, and she had been confined to bed for five weeks.

The right calf and ankle showed an unusually widespread fungating growth with sinuous edges, bordered by low papillary masses everted on the skin surface. These nearly covered the base also, although they were intermingled with much gangrenous tissue. The masses were much firmer than granulation tissue, and very vascular. The growth had spread over two thirds of the circumference of the leg in the lower and middle third and over the lateral malleolus. There was a small perforating ulcer over the fifth metatarsal bone. Even in the areas not obviously infected, the tissues of the foot and ankle were extremely edematous, and the peroneal and tendons of the anterior muscle group were exposed and partially atrophied (Fig. 2).

The extremity was amputated in the middle third of the thigh, the wound healed, and the patient has remained well for five years.

Microscopic examination showed (Fig. 3) that the papillary projections are composed of a highly differentiated type of squamous cell epithelioma.

LITERATURE

Slight inspection of the literature will at once show that it is difficult to separate these carcinomas from those originating in other chronic inflammatory processes. In many of the older accounts, also, no attempt is made to exclude contributory causes, such as syphilis or other dermatologic lesions. No classification can, therefore, be considered wholly accurate even though most of the "scar carcinomas" and "fistula carcinomas" can be excluded.

* From St. Luke's Hospital.
* Read before the Section on Pathology and Physiology at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Nobl: Der varicose Symptom Complex, Berlin, 1918, p. 143.
2. Grosser, M.: Cancer of Leg, Arch. f. klin. Chir. **127**: 529, 1923; abstr., J. A. M. A. **81**: 2156 (Dec. 22) 1923.

The former are not numerous, the reported cases numbering less than fifty if we exclude the lupus scars. They are epitheliomas usually arising on the extremities, but, like other epitheliomas, are more numerous on the face. They have followed, usually after many years, the healing of a single lacerated wound or a burn, though in rare instances other forms of trauma, as a dog-bite or freezing, have preceded the scar and been regarded as the cause of it by the patient. A case which is illustrative of the group is that of Volkmann.[3] The patient was a man who sustained a lacerated wound of the calf at the age of 27. This healed without prolonged suppuration or bone necrosis, but the scar broke down thirty-five years afterward and the resulting ulcer grew rapidly with every indication of malignancy. Such a condition has, if syphilitic, as a few of these may be, the disturbance in its vascular supply, possibly not much different from that which obtains in the region of a varicose ulcer. This might be considered as evidence that the altered and deficient circulation cannot be regarded as an important factor in developing malignancy, and, in fact, it might well be thought an inhibiting influence.

The fistula carcinomas, of which about the same number, forty-five, have been described, have also developed most frequently on the calf or ankle. These patients have practically all suffered from early osteomyelitis, which later became chronic and eventually gave rise to an ulcer of considerable size. In many cases the infection dates from childhood, and the chronic sinuses like the crural ulcers may or may not have healed at times; but finally tumor tissue has appeared, in the fistulous tract, in the ulcer, or in the scar tissue surrounding them. The malignant process has, of course, added to the destructive bone lesion so that the end-results may be indistinguishable from the varicose epitheliomas, which also secondarily absorb and erode bone. Either type not infrequently has caused a spontaneous fracture.

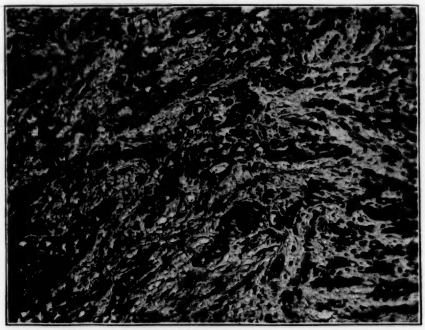

Fig. 1 (Case 1).—Margin of ulcer, showing relatively undifferentiated type of cell and infiltrating character of growth.

Of the third class, or varicose carcinomas, about fifty cases have been described, while six others have been referred to in the literature, or described orally in personal communications, exclusive of those in persons known to be syphilitic. It is unnecessary to give detailed accounts of all the reported cases, as the clinical histories are remarkably similar; but a survey of the literature is of sufficient interest for a brief summary.

The most comprehensive discussion is the monograph of Volkmann,[3] who, in 1889, collected the cases of this type as well as the other carcinomas located on the extremities. Twenty-four were associated with varicose ulcers.

Gant,[4] in the same year, described another case seen at the Royal Free Hospital in London, although this, like a few others, may have arisen from a cutaneous growth which became infected and ulcerated. In any case, the ulcer remained nearly stationary for a long period before there was any evidence of malignancy.

Michael,[5] in 1890, reviewed Volkmann's material and added reports of twenty-six cases of carcinoma of the extremities seen in the Tübingen clinic, eight of them associated with crural ulcers.

Druckenmuller,[6] in 1895, reviewed Michael's cases, and contributed accounts of three more cases, one being only the third on record in which bilateral crural ulcers both formed the starting point for carcinomas. Druckenmuller's case occurred in a woman, aged 58, who had had ulcers on both legs since 25 years of age. Both had healed at times, only to break down again, but for the past year there had been rapid growth in each. One was 9 cm. in diameter, the other twice its size, and both showed fungating masses on base and edges.

Volkmann's patient was a man, aged 51, who also had had crural ulcers for twenty-five years with rapid growth in each for six months. There were large cauliflower-like masses on the outer sides of the ulcers. Local excisions were done, with a rapid recurrence on one side.

The third bilateral case is a recent one reported by Grosser from the Urban Hospital. The patient had bilateral ulcers for many years, one eventually becoming carcinomatous; the leg was amputated, but seven years afterward the patient returned with the same condition on the other leg.

These three cases are of interest for, like other multiple growths, they suggest the important question of the part that is played by individual predisposition.

Nobl describes with illustrations, three cases which he had seen and which depict three slightly different forms that this type of growth may assume.

Neumann[7] and Woolsey[8] each briefly describe one specimen, and DaCosta[9] adds two more.

A more recent discussion is that of Gottheil,[10] who saw only three specimens in his experience at the Metropolitan Hospital, New York, where, of course, a large number of dermatologic lesions was constantly observed. He believes that the chronic dermatitis rather than the vascular condition should be regarded as the important preceding lesion, and thinks that whatever alteration there may be in the circulation is merely a contributory factor to a process that begins in exactly the same manner as do the epitheliomas following syphilis, tuberculosis and other chronic skin diseases. In discussing Gottheil's paper, Hazen described a case seen by him in which the varicose ulcer had existed for fifteen years, and simultaneously with the onset of an

3. Von Volkmann, Rudolph: Samml. klin. Vortr., 1886-1890, Chir. No. **335**, p. 235. Bang: Le cancer des cicatrices, Bull. du cancer **14**: 201, 1925.
4. Gant: Lancet **2**: 698, 1889.
5. Michael: Ueber der primaren Krebs der Extremitaten, Inaug. Diss., Tübingen, 1890.
6. Druckenmuller: Beitrag zur Kasuistik der Carcinom entwicklung auf Unterschenkel Geschwuren, Inaug. Diss., Greifswald, 1895.
7. Neumann: Ann. de dermat. et syph. **2**: 1058, 1898.
8. Woolsey: Ann. Surg. **43**: 610, 1906.
9. DaCosta: Ann. Surg. **37**: 496, 1903.
10. Gottheil, W. S.: Cancerous Degeneration in Chronic Leg Ulcer, J. A. M. A. **59**: 14 (July 6) 1912.

acute eczema in the surrounding skin the malignant process appeared. Agreeing with Gottheil, he seems to feel that the cutaneous inflammation gave origin to the epithelioma.

Heidingsfeld, in discussing the same paper, mentions two cases which he saw at the Cincinnati General Hospital, and I am indebted to the following for oral accounts of three more: Dr. John Douglas, one case at Bellevue Hospital, New York; Dr. G. L. Rohdenburg, one case at the Lenox Hill Hospital, New York, and Dr. Lyman Richards, one case at the Turkish Hospital, Smyrna.

Grosser, extending Volkmann's compilation, describes six more cases of crural ulcers with epithelioma. All his patients had had ulcers for many years, and a woman, aged 34, showed involvement of inguinal nodes by the tumors.

De Jong, Meyer and Martineau [11] described a varicose carcinoma of the leg treated for eight years with a preparation containing tar. The patient was a man, aged 85, seen in 1916 with varicose eczema of the leg. To allay itching, the tar preparation was applied and so successfully that the patient continued the applications until 1924, when he was again seen, this time with a brown dermatitis, edema of the leg, and an ulcer with ragged, overhanging edges. A biopsy showed that the fleshy portions consisted of squamous cell epithelioma. It will be questioned whether the application of the tar preparation was effective in transforming the inflammatory condition into a malignant one, but in view of the extensive experimental work on tar carcinoma in mice, it is of considerable interest.

Fig. 2 (Case 2).—Extensive ulceration and papillary type of growth covering the entire surface.

Summarizing these cases as a group, we find that about the same number have occurred in men as in women, a fact not usually regarded as true of the benign varicose ulcers. Of the fifty-nine cases, the sex is stated in fifty-three. Of these, twenty-eight, or 52 per cent., were in men, and twenty-five, or 48 per cent., were in women.

The ages are given in forty-nine cases: from 30 to 39 years, three cases; 40 to 49, thirteen; 50 to 59, fourteen; 60 to 69, seventeen; 70 to 79, two. This shows plainly that the incidence between the ages of 40 and 60 is practically constant, and that it is virtually the only age period in which the condition appears.

The duration of the ulcer prior to the tumor growth is of even more interest. In nearly all instances they are said to have existed "for many years." In the twenty-eight cases in which the term is stated, the average is 21 years, with a maximum of 40 and a minimum of 10. The onset of the malignant process has nearly always been noted by the patient himself, either because of increasing pain or because of rapid growth of the exuberant cauliflower-like masses, or, in a smaller number of cases, by the rapid extension of the crater. The time elapsing between this change and the appearance of the patient in the hospital has generally been about a year, fifteen cases giving an average of fourteen months.

The diagnosis is fairly certain when these solid vascular outgrowths appear on the formerly smooth, indolent base, and the edges assume a fungating character. The warty masses are solid and fleshy, and possess a cellular translucent appearance, not seen in the small, soft granulations that are occasionally present in many chronic ulcers.

There are two distinct morphologic types assumed by these growths. In the one, which is more common, the hyperplastic tendency dominates the picture. The ulcer may be shallow, as in the second St. Luke's case, the papillary masses small and numerous, fringing the edges and base uniformly. The second type, which is rarer, shows the destructive and ulcerative aspects of the malignant process, the growth being more concealed under the margins, which it infiltrates and undermines. The warty nodules are larger and firmer than in the first type, and may be found only on the base. Not infrequently, however, the papillary growth appears in only a part of the ulcer, as at one side. In such a case, it has not been determined whether the entire circumference is carcinomatous.

Amputation has been performed in the majority of cases, generally without observed recurrences for a period of several months or years; but to attempt to draw exact conclusions regarding the outcome of these cases as a group is impossible, as relatively few have been followed for more than a year. Several, however, have been free from any recurrence or metastasis for three or four years, in one case, fourteen years; therefore complete cures are not unlikely. The mortality from septicemia was considerable in the earlier cases.

Involvement of the inguinal nodes is neither constant nor early. They have usually not been resected at the time of operation unless definitely carcinomatous. In about 16 per cent. of the cases, a subsequent metastasis has appeared in the inguinal or retroperitoneal nodes. At least three patients have died from pelvic or other extensive metastases, and two of these from hemorrhage due to erosion of the femoral or popliteal artery by such a recurrence.

COMMENT

Gottheil's assertion that the varicose ulcer is a misnomer is one that may find more dermatologic than surgical support. Of course, there is no doubt that the

11. De Jong, Meyer and Martineau: Bull. du cancer **13**: 326, 1924.

two lesions are almost invariably found together, and both may contribute to the end-product. It is noteworthy, however, that only a few of the dermatoses have directly given rise to epitheliomas either in the lower extremity or on the hands and face, where both conditions are much more frequent.

Epithelioma arising in lupus scars is generally recognized as a fairly frequent occurrence, and may occur in either skin or mucous membrane. It is estimated by Zweifel-Payr [12] that 2 per cent. of the lesions of lupus vulgaris eventually show epithelioma. Only rarely does malignancy occur in an active lupus erythematodes. Ashihara,[13] who collected reports of about 300 cases of all types of the latter epitheliomas, pointed out that, in several larger series of cases reported from different sources, each showed the incidence of epithelioma arising from old tuberculous scars to be more than twice as frequent as those appearing during the course of a florid lupus; that is, 70 per cent. of the cases were of the former type. For this reason the dermatologists have regarded most of the cases only as scar carcinomas and do not believe that the tubercle tissue has any especial significance. Orth, however, in studying the problem from the point of view of relative tissue resistance, questions whether the effect of the tuberculous granulation tissue is not to remove in some special way the normal controlling mechanism which causes epithelial cells to cohere.

Fig. 3 (Case 2).—Papillary mass, showing differentiated type of growth; low power.

The fact remains that epithelioma of the skin is much more frequent following lupus than any other chronic skin disease.

Psoriasis and syphilis are likewise possible, but unusual, predisposing types of inflammation. Roentgen-ray epithelioma is relatively common. Chronic eczema is an extremely common condition, and the inflammation extends over long periods, but it is not considered a causative agent except in the skin over the tibia. It is apparently not necessarily keratoses in which epithelial hyperplasia is a factor from the beginning which form the basis for the malignant process. It seems, therefore, that these two factors, either an epithelial hyperplasia or some specific etiologic agent, must be added to the exudation caused by irritation.

Cancer research has been directed by this observation, and successful experimental carcinomas have been produced by special agents believed to have excited spontaneous carcinomas to growth. Hot tar, which has long been believed occasionally to cause multiple human epitheliomas, as in the case described by Voigt,[14] has been used successfully on the skin of white mice and the rabbit's ear; on the other hand, the skin of albino rats is not sensitive to tar painting. The duration of the irritation is of the first importance, illustrating again the fact that the irritation alone is only one factor, and that we are largely in ignorance of the others. Irritation epitheliomas cannot be induced in six months, whereas they may be in twice that time in animals. This may be analogous to the fact that these varicose ulcers have been usually present from fifteen to twenty years before a malignant change has occurred.

Fibiger [15] has produced a few epitheliomas in the stomach of the mouse and of the rat by irritation of *Spirotera* in these tissues. This irritation also must be continued for a considerable part of the animal's life before any such growth occurs.

In these experiments, as in the epitheliomas arising in the mouth and lips in human beings on an ulcerative or irritative basis, there is presumably a normal blood supply — the factor that is absent in these varicose carcinomas. There is no doubt that, whatever the other circumstances, a carcinoma will grow faster, when once formed, if the blood supply is adequate. To explain the rarity of these lesions, we must again take refuge behind that unexplained but obviously important question of local and individual predisposition. If the geneticists are right and cancer is due to susceptibility and irritation, it remains difficult to understand why, with so many patients exposed to this irritative condition for so many years, the hereditary tendency should be so ineffective a factor and so few epitheliomas develop. The hereditary predisposition would then be assumed to be local—a wholly impossible conception for the human race. That the epithelium of the lower extremities has always been an infrequent site for epitheliomas, despite the irritation to which they are subjected, is admitted. The response to irritation of any type in this locality is regularly in the direction of a protective reaction or benign hyperplasia, as in the callosities that occur on the feet. Epithelioma developing from such callosities is not unknown, but it is extremely rare. It is an astonishing phenomenon that, among only fifty-four leg carcinomas, three should be bilateral, and can be explained at present only on the basis of individual predisposition.

CONCLUSIONS

There are accurate reportes of only fifty-nine epitheliomas arising in chronic varicose crural ulcers.

The number of the reported cases is about the same as those arising in scars and fistulas.

12. Zweifel-Payr: Die Klinik der bösartige Geschwülste, Leipzig, 1924.
13. Ashihara: Arch. f. Dermat. u. Syph. **57**: 193, 1901.
14. Voigt: Beitrag zur Entstehung des Krebs auf chronischen Entzündungen und auf Narben, Inaug. Diss., Berlin. 1893.
15. Fibiger: J. Cancer Res. **9**: 367, 1919.

These occur almost exclusively between the ages of 40 and 60, run a slower course than other squamous cell epitheliomas, and probably lead to metastasis later. They are in no sense benign.

It is probable that chronic dermatitis more than the varicosities and altered blood supply alone incites the condition.

These tumors seldom arise until an ulcer has been present for at least fifteen years.

Amsterdam Avenue and One Hundred and Thirteenth Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. WOOD AND KNOX

DR. FRANCIS CARTER WOOD, New York: I should like to say a word about Dr. Knox's paper from the general point of view of causation of cancer. She has hinted in regard to the question of hereditary susceptibility. There is no question that there are families in which a large proportion of the members die of cancer, and there are other families in which no one dies of cancer, even though they all reach cancer age. Of course, the animal experimentation done by Maude Slye in Chicago and by Bullock and Curtis in my laboratory have definitely proved that in animals a susceptibility to cancer is transmissible. Of that there is no question. The breeding experiments, however, are so complicated and take so long that if they were applied to human beings, it would mean that for the last 5,000 years both parents of these unfortunate human beings would have had to have cancer. That is a concentration of breeding which cannot occur in the human race. So the facts of the high incidence of cancer in these experimental studies cannot be applied in full value to human beings. The sixty cases that Dr. Knox has with great labor been able to collect from the literature represent an infinitesimal fraction of the population of that age, and during that time thousands of persons of the same age were dying of cancer in other areas. Must we assume, then, that there are local susceptibilities in the body, that the skin of the legs does not carry an hereditary susceptibility and that that of the tongue and lips does, or must it be a question of the potency of the irritant in the different areas? The paper raises that very interesting question, and it will be necessary to collect a large amount of material to answer it. Cancer of the tongue and cancer of the lip of course kill four or five thousand persons annually in the United States, and probably not more than one or two die of leg ulcers, perhaps not that many. What is the cause of this difference? We are at present unable to answer that question.

DR. J. SHELTON HORSLEY, Richmond, Va.: There is no part of the body on which irritation is so common as on the palmar surfaces of the fingers, and yet I have never seen a cancer develop there. On the other hand, at points of irritation in the mouth, cancer is common. It would seem possible that the tissue on the palms of the hands and the soles of the feet was stabilized in evolutionary times to such an extent that it acquired resistance, whereas other tissues have not acquired a resistance to new traumas, such as the use of tobacco. That, of course, is just a theory, but it is one way of explaining the very obvious difference in the reaction to irritation in the different parts of the body. Basal cell cancer presents an interesting problem. It practically never metastasizes. It varies greatly in morphology and structure, possibly because it comes from the deep layers of the epidermis and is more closely akin to the sweat and sebaceous glands and the hair follicles than spinous cell cancer, and, being closely akin, it may revert more easily to adenomatous structure. At any rate, a very distinct glandular structure sometimes occurs in basal cell cancer. In intractable basal cell cancer, after excising the cancer I have transplanted a flap from a distance with the idea that there is some natural resistance of tissues at a distance to basal cell cancer which prevents metastasis. If basal cell cancer does not metastasize, there must be a reason for it. It grows in a rather regular zone of infiltration, and it seems as if it must elaborate some material which breaks down the resistance of the normal tissue to the advance of the basal cancer. On the other hand, spinous cell cancer of the more malignant type and arising in the same region is transported and readily grows in lymph nodes. In ten cases treated on this theory, there have been five recurrences and five have not recurred. Several are of very recent date. One of the patients died from angina three years after this operation, and there was apparently no recurrence of the cancer after the transplantation of a distant flap. Recurrences in five cases were not in immediate contact with the flap nor in the flap, but in tissue a little distant from the flap, and never any closer than 0.5 cm. Sometimes they would grow to the margin of the flap and there would stop. Whether sooner or later the resistance of the flap will be broken down and the cancer involve the flap I do not know, but this has not occurred so far. In a case of spinous cell cancer, quite advanced, in which an extensive operation was done, including excision of the external ear and the tissues in the temporal region, I transplanted from the back a flap in stages so as to develop the nutrition. This was done simply for cosmetic purposes and not with any idea of cure. There was a recurrence of the cancer from the epithelial tissue lining the canal of the ear, which had not probably been thoroughly removed. That occurred about the middle of the flap and readily grew through the flap. This case may be said to have acted as a kind of control.

DR. ISAAC LEVIN, New York: I wish to subscribe to the statements of Dr. Wood. All we can do for a patient with an advanced cancer is to prolong his life for a while. It is interesting to note in connection with the experimental work presented by Wood that it is much more difficult in the human being to influence therapeutically a metastatic tumor than the primary condition. Surgical excision, radium and even cauterization may destroy a carcinoma of the lip, but it is extremely difficult to influence the metastases in the lymph nodes of the neck. The inoculable tumors with which Wood experimented represent in reality experimental metastases. It is difficult to offer correct analytic deductions in cancer research, since the fundamental premise, the etiology of the disease, is unknown. The investigation of Dr. Knox represents the most efficient method for the study of both the etiology and therapy of cancer. Wood uses thousands of mice and rats in experimental cancer research, and the life cycle of these animals is only two years. How much more difficult is the problem in man, in whom the life cycle is seventy years. In order to advance our knowledge in human cancer, thousands of cases have to be studied throughout the world and the results checked up in a common clearing house. I look forward to the day when every municipality in the world will maintain an institution for clinical cancer research and when all the investigators will have opportunity to compare calmly and carefully one another's results.

DR. E. A. CASE, Philadelphia: Dr. Wood has so thoroughly covered the question of immunity that there is very little to say, but I would just like to add this: I think it is the experience of every efficient pathologist who has had an opportunity to examine tissues that have been irradiated some time previously, in which a so-called clinical cure has been established, to find tucked away, carefully covered up by connective tissue, these little areas of viable cancer cells, for one occasionally finds in them evidence of proliferation. I recall one case in which practically the entire tumor was destroyed, and yet down deep in the tissues we found these cancer cells. Clinical evidence in addition to pathologic evidence has shown us that in so-called clinical cures not only recurrences but also metastases occur as late as ten or twenty years afterward. I recall one case that is quite classical in our city of a sarcoma which eventually destroyed the man's life twenty years after he had his eye removed.

DR. A. J. CARLSON, Chicago: Dr. Wood's paper, as well as the paper of Dr. Knox, seems to show that it is entirely possible to do the same accurate observation to demand the same scientific control, and use the same kind of mental

processes in clinical work as in so-called laboratory research. If that is possible, why don't we insist on it; why don't we apply it universally? There are not kinds of facts, so-called laboratory facts and clinical facts. If they are facts, they are facts, and they are established in the same way. I am familiar with Dr. Slye's work, and I have waited for this type of experiments on the hereditary cancer material. I should like to know whether these strains with the high incidence of spontaneous tumors are more susceptible to the various agents that induce so-called experimental tumors.

DR. FRANCIS CARTER WOOD, New York: The possibility of the locking up of cancer cells in the tissue for long periods is familiar to all students of the disease. It may occur after radiation treatment, or after radical removal of a tumor. One interesting example was a patient with epithelioma of the lip who had been treated thirteen years previously with radium. A recurrence took place at exactly the same site as the primary tumor and with exactly the same morphology. The assumption that a new tumor had occurred at the same place is therefore unwarrantable. In other words, for thirteen years cancer cells remained in abeyance in the scar. There are many other examples of late recurrence in scars produced by treating cancer with caustic paste or after freezing squamous cell epitheliomas of the face with carbon dioxid snow; also I have seen many scar recurrences after radical mastectomy five and ten years after the operation. The facts of which Dr. Carlson spoke are well illustrated by certain experiments on rats at the Crocker Laboratory. By infesting the animals with a parasite which forms a cyst in the liver, we have been able to find those whose livers were susceptible to irritation by the production of a sarcoma. This in the ordinary run of laboratory rats is about one in 500. By breeding together those rats which proved to be susceptible to the development of a tumor, we have obtained a susceptible strain whose livers have an enormous susceptibility to the irritation of a parasite. Sometimes we get a 100 per cent. susceptibility in a litter of animals. This shows that by selective breeding the liability of an organ to develop cancer under the action of a definite stimulus can be concentrated. In other words, it demonstrates in rats what has been known for forty years in man, that a congenital tissue susceptibility is transmissible. The answer to Dr. Carlson's question brings out a theory tested by another experiment: The skin of the ordinary white rat does not react to tar painting by the production of cancer, though the skin of mice is exceedingly sensitive. We thought that possibly the strain of rats with highly susceptible livers might also have skins which had become susceptible, but on painting a large number of animals with tar no skin susceptibility was found. Thus the susceptibility was entirely for a single tissue—the connective-tissue structures of the liver.

Gland Extracts Mostly Devoid of Action.—We meet with advertisements of extracts of blood (hemoglobin), bone marrow, muscle, spinal cord, brain, lymph gland, spleen, prostate, ovary, testis, mammary gland, duodenum, pancreas, liver (bile), placenta, gastric mucous membrane and kidney, to say nothing of the adrenal bodies (both cortex and medulla, and the whole gland); thyroids, parathyroids, pituitary body (both anterior and posterior lobes and the whole organ), the pineal body, and the corpus luteum. Various mixtures of these extracts are also put on the market and are presumably sold, as e. g., ovary and mammary gland extracts. mixtures of extracts of lymph gland, testis, spinal cord, and brain; combinations of thyroid and pituitary substances, and of thyroid adrenal extracts; such combinations as "polyglandin," a mixture of thyroid, parathyroid, ovary, testis and pituitary extracts. Several of these combinations are sold with or without the addition of the drugs, under various fanciful names, as "virtilogen," "mammagen," "ferovarim," etc. Now in the case of the great majority (in fact, in all except one) of these preparations there is no evidence that any effects whatever are produced when they are given in the ordinary way by the mouth, unless they are given in such quantities as to serve as foods.—Vincent, Swale: *Proc. Royal Soc. Med.* **18**:30 (June) 1925.

REVERSE PERISTALSIS IN THE BOWEL, A PRECURSOR OF VOMITING *

WALTER C. ALVAREZ, M.D.
SAN FRANCISCO

It is remarkable how little has been written about the behavior of the bowel during the act of vomiting. One can read for days about the rôles played by the medulla, the vagi, the pharyngeal sensitive points, the esophagus,

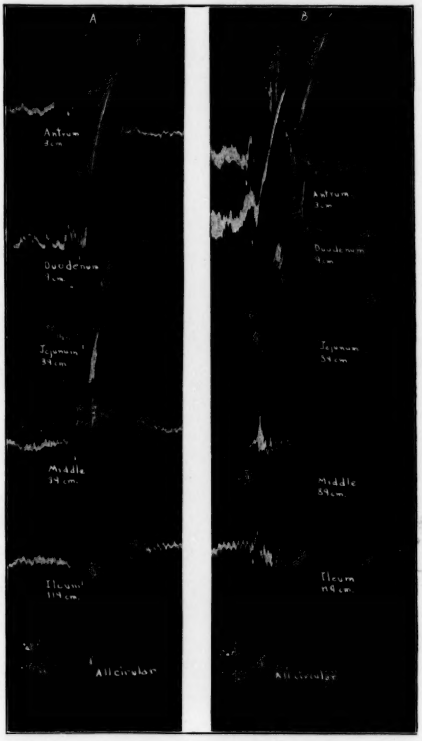

Fig. 1.—Records depicting waves of reverse persitalsis in the cat's bowel preceding vomiting.

the abdominal muscles and the stomach, but only here and there will one find a brief reference to the bowel. Significant of this state of affairs is the fact that in Hatcher's [1] summary of our knowledge about vomiting I can find no word about the bowel.

Certainly there must be some reason for this blind spot in our vision, and the most probable one is that we have never been able to record exactly what is going on in the various parts of the bowel at the same time. Another reason is that in our lay youth we become so

* From the George Williams Hooper Foundation for Medical Research, University of California Medical School.
1. Hatcher, R. A.: Physiol. Rev. **4**: 479 (July) 1924.

used to thinking of the stomach as the organ of digestion that later, when we should know better, we sometimes forget that there is such a thing as a bowel. Another trouble lately is that our attention has been diverted from the abdomen to the vomiting center of the brain, largely on account of the experiments of Eggleston and Hatcher [2] which showed that an animal can retch even when its digestive tract from cardia to anus has been removed.

Although there can be no question about the importance of the nervous mechanism which Hatcher and his

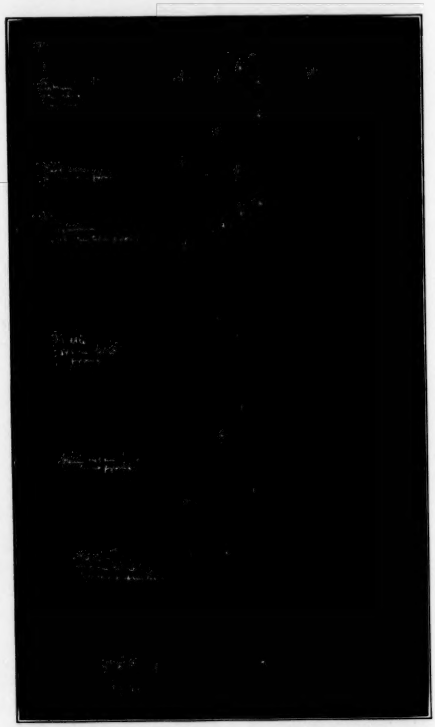

Fig. 2.—Record depicting a combination of tonus contractions and a reverse wave associated with vomiting.

associates have demonstrated, it seems to me that the possibility still remains that certain types of vomiting either originate in reverse peristalsis in the bowel or else are associated with it. I see no reason why the emptying of the intestinal contents into the stomach or even the mere reversal of peristalsis in the bowel should not be one of the many factors that we know can call forth those coordinated activities of stomach, diaphragm, abdominal muscles and esophagus which we call vomiting.

We know also from the experiments of several workers on different animals that the stomach can empty itself orad without any help from the abdominal press; and we see much the same thing in infants and some adults when large amounts of material are regurgitated from the stomach without apparent effort. Actually, in these cases it is often hard to say whether we are dealing with pure regurgitation or real vomiting, because they shade so, one into the other.

Clinicians and surgeons know also that men and women with acute appendicitis or other irritating or obstructive lesions in the bowel will sometimes vomit large amounts of fluid a few minutes after their stomachs have been washed clean. This fluid will often be bile-stained or tainted with feces or enema material, showing clearly that it has come from the bowel.

The strange inability of many writers to conceive of an active reversal of peristalsis in the bowel is shown again by their rather thoughtless statements to the effect that this regurgitation is due to suction by the stomach. Just how this suction is accomplished by soft collapsible tubes that cannot actively dilate is not specified.

Twelve years ago, when I first began the study of the intestine with the animal opened under salt solution, I saw on several occasions waves of reverse peristalsis. I was watching the intestines of cats under urethane anesthesia, with their lower cords pithed, the rectum tied, and the colon filled with pea-soup or soapy water. After an hour or more the colon would usually become very active in its efforts to rid itself of its contents, and occasionally then a wave carrying some of the soapy water would travel rapidly up to the jejunum or even to the stomach.

On many occasions also I was struck by the fact that gastric regurgitation or actual vomiting had been preceded by a short period during which there was great activity in the small bowel. On searching through the literature, I found that some of the older writers on vomiting had observed this phenomenon. I observed it also in a man with a jejunal fistula. He happened to vomit one day while I had a balloon in his bowel, and it was very evident from the record that a marked increase in the activity and tone of the jejunum had, for about two minutes, preceded the retching. Actual reverse transport of material was shown by the fact that he vomited the egg-milk mixture that had been given him through the fistula.

Two years ago when Miss Mahoney and I [3] began to get good records from several parts of the cat's bowel at one time, we were able, not only to see a number of reverse rushes traveling up the bowel, but also to record them graphically. Two typical records are shown in Figure 1. Unfortunately, details of the gastric record were obscured by the retching movements. In Figure 1*A* it will be noted that vomiting was apparently initiated by a pinching of the fundus of the stomach. The effect of this pinch was registered immediately from one end of the tract to the other, and fourteen seconds later a small reverse rush passed the recorder on the ileum 119 cm. from the pylorus. It seemed steadily to gather force as it went, and it passed the upper duodenum, 9 cm. from the pylorus, six or seven seconds later. Its rate of travel was therefore from 16 to 18 cm. per second.

Figure 2 shows what happened when the animal regurgitated so much that, for a moment, we thought that it was really vomiting. The record shows, however, that there were no retching movements. A rise

2. Eggleston, Cary; and Hatcher, R. A.: J. Pharmacol. & Exper. Therap. **3**: 551, 1912; **7**: 225, 1915.

3. Alvarez, W. C., and Mahoney, L. J.: Am. J. Physiol. **69**: 212 (July) 1924.

in tone began practically simultaneously in "middle" and "ileum." A wave then traveled steadily from the ileum to the duodenum but did not seem to reach the stomach. At 2, there was another rise in tone, which was almost synchronous from colon to stomach. The only exception was that the duodenum responded with a drop. At 4, the animal regurgitated, and the tone of the gastric antrum fell. The interesting feature here is the reverse wave traveling up the bowel, associated with peculiar rises in tone which appear at the same time in almost all parts of the tract. I have commented before on a similar phenomenon in the stomach where systoles are sometimes associated with waves traveling up and down. Attention is called also to the marked drop in tone that occurred in the ileum two minutes before the rise began, and 4.5 minutes before the animal regurgitated.

Figure 3 shows again how long a time the intestine may spend in preparing for a vomiting spell. We note the rise in tone of the duodenum and jejunum at *A*, three minutes before the animal began to retch. A second disturbance, which appeared throughout the tract at 1, was most marked at the lower end. It traveled upward so slowly that it reached the stomach after vomiting had begun.

Dr. Zimmermann and I have recently obtained records from a rabbit showing an orad progression of powerful contractions. Unfortunately, we could not see clearly what was going on, so we cannot say definitely that it was a reverse rush wave, but that is the logical inference from the records.

COMMENT

The fact that a number of these records show a temporary depression before the sudden rise which marks the advancing wave, brings up the question of Bayliss and Starling's law. Such a depression is assumed by most writers to mean temporary inhibition; but when we watch very carefully we see that some, or perhaps all of it, can be due to distention by the column of intestinal contents, which is pushed ahead by the contraction-wave much as a train of cars is pushed by an engine. We cannot deny that there may be an element of inhibition sometimes present, but neither can we assert that it is present until we can exclude this element of distention.

If we should decide that at least a part of this drop in the record is due to inhibition, we would be faced by a difficulty in that we could no longer follow those who say that the myenteric reflex is brought about by a certain arrangement of neurones in Auerbach's plexus. Such a structure could hardly be reversed so suddenly. Furthermore, if the myenteric reflex will work equally well both ways, up and down the bowel, we can no longer ascribe to it the faculty of maintaining the caudad direction of peristalsis.

We have some difficulties also in reconciling our findings with the gradient theory. According to that theory, waves travel down the bowel simply because there is a gradation in metabolic rate, tone, rhythmicity and sensitiveness to distention or to the presence of food, from the duodenum to the ileum. Material moves from the more active, irritable regions to less active and less irritable ones. Although this gradient is built into the structure of the bowel, it can probably be upset quite easily by agencies which either increase the activity of the lower end or lower that of the upper end. Sometimes we can show a flattening or reversal of the rhythmic gradient in sick animals or in animals that have been vomiting or refusing food, but there are puzzling exceptions. We find also that distempered dogs will have a decided flattening or reversal of the gradient of latent period without much change in the rhythmic gradient.

Flattened rhythmic gradients were actually found in a number of the regurgitating cats observed during this study, but it happens that the particular animals whose records are shown here had a good gradation running

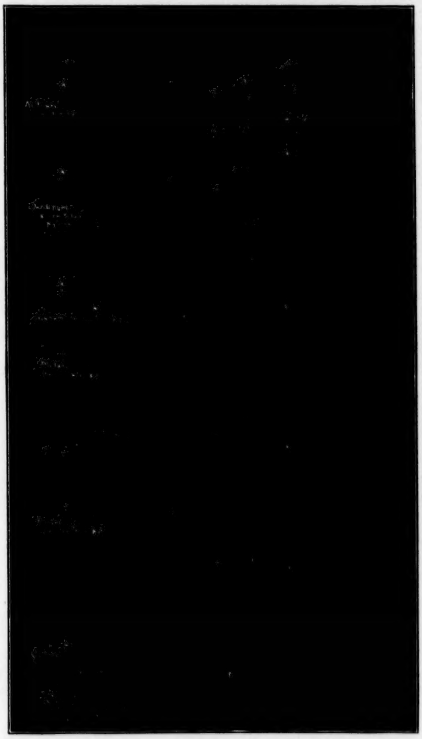

Fig. 3.—Record showing how long the bowel may take in preparing for vomiting. In this case the reverse wave reached the stomach after vomiting had started.

from 18 per minute in the duodenum to 10 in the ileum. The rabbit with signs of reverse peristalsis had no rhythmic gradient below the upper jejunum. This was due to a lowering of the normal rate in the duodenum and jejunum and a rise in the rate of the lower ileum. Just why this occurred we do not know, as the animal seemed to be healthy.

Studies on scores of animals during the last twelve years have given me the impression that the rhythmic gradient is not changed much by acute processes such as sudden intestinal obstructions. It seems to be flattened or reversed only if the animal is sick for some time. Reverse peristalsis may take place in animals

with good gradients if the tone or irritability of the lower end of the tract is raised sufficiently. Once the wave is started orad it can travel even against the gradient, because the material that is pushed ahead is constantly giving rise to new contractions. Regurgitation caudad cannot take place because, as we may see from the records, the bowel remains tonically contracted for a minute or two after the wave has passed. By that time, the head of the onrushing column is far away. This mechanism has been discussed more fully in another article on peristaltic rush.[3]

Naturally, when there are powerful contractions and marked rises in tone in the lower ileum, waves may travel out in both directions from the irritable point, and we know that diarrhea actually is often associated with vomiting.

It is well known, of course, that regurgitation from the duodenum into the stomach is a normal happening at certain stages of digestion.

There would seem to be no question, then, that vomiting is often preceded by an increase in the activity of the bowel, by a rise in tone there, and sometimes by a wave of reverse peristalsis. Unfortunately, we cannot yet say just what bearing these changes have on the events that follow. They may lead up to the vomiting act and may be partly or largely responsible for it, or they may be but a part of the vomiting complex brought on by influences coming from the center in the medulla.

As I[4] pointed out several years ago, it is suggestive that nausea is felt by many people in ascending waves which may perhaps correspond to actual waves on the bowel. Many persons are distressed the minute their hearts develop abnormal types of rhythm, and I see no reason why abnormal types of peristalsis should not similarly register themselves in some way on our consciousness.

Just as this paper was being sent off, the article of Keeton[5] appeared in which he reports the production of nausea in human subjects by the injection of various substances into the duodenum. Some of his findings suggest that, with the waves of nausea, the bulb on the end of the tube was returned to the stomach. Ivy and Vloedman[6] have recently observed the same thing.

SUMMARY

Writers on vomiting have ignored the part played in the act by the bowel.

The regurgitation of intestinal contents into the stomach during or preceding the act of vomiting must be a common occurrence, judging from clinical observation.

Records made simultaneously from several regions of the bowels of cats, opened under a warm bath of salt solution, show that vomiting or regurgitation of gastric contents is almost always preceded by an increase in the tone and activity of the small intestine. Actual waves of reverse peristalsis have also been observed and recorded.

An increase in the tone and activity of the jejunum beginning two and one half minutes before the onset of vomiting was recorded graphically in a man with a jejunal fistula. Food put into the fistula was vomited.

Depressions which suggest a preliminary inhibition, but which may be due only to distention by the oncoming intestinal contents, are observed in some of the records. If we assume that this represents inhibition, then Bayliss and Starling's law can be demonstrated with reverse waves as well as with caudad ones, and it can no longer be assumed to be the cause of normal peristalsis.

4. Alvarez, W. C.: The Syndrome of Mild Reverse Peristalsis, J. A. M. A. **69**: 2018 (Dec. 15) 1917.
5. Keeton, R. W.: Nausea and Related Sensations Elicited by Duodenal Stimulation, Arch. Int. Med. **35**: 687 (July) 1925.
6. Ivy, A. C., and Vloedman, D. A.: Am. J. Physiol. **72**: 105 (March) 1925.

THE DOG AS A CARRIER OF DISEASE TO MAN*

MINAS JOANNIDES, M.D.
AND
WILLIAM A. RILEY, PH.D.
MINNEAPOLIS

Our object in this paper is to emphasize the fact that the dog acts as a carrier of disease when not properly managed. No attempt will be made to give a detailed discussion of the various diseases that a dog may carry. Our purpose will be accomplished if groups interested in public health and hygiene will consider the dog as a possible carrier and study him from that point of view.

The fact that the dog is a carrier of disease has been recognized by parasitologists and zoologists all over the world. With the exception of the work of M. C. Hall[1] in this country and Cameron[2] in England, no recent concentrated effort has been made to bring this problem before the general public or even before the medical profession. In Minnesota, some attempts have been made to bring the topic before the medical profession.[3]

There are two modes of disease transmission by the dog; first, when the dog contracts a disease and carries it to human beings, or when it acts as an intermediate host of various parasites; second, by coming in contact with some infected article and carrying the infection into the household. As a pet, the dog has become a very intimate member of the home. The average pet dog is allowed to lie on its master's bed, or even to eat from the same plate. The dog is allowed to roam, and on coming back is permitted to play with the children of the family, and thus renders possible infection with various animal parasites, skin diseases, or pathogenic bacteria.

During the last two years, we have examined the intestinal lumen of all our laboratory dogs that came to necropsy. Our observations convinced us that it would be unusual if a dog did not have intestinal parasites. Although most of the parasites have adapted themselves to the conditions found in the dog's intestine, and perhaps may not be obnoxious in the human intestine, still there are parasites, such as various trematodes, nematodes and cestodes, that are definitely pathogenic for man. The dog may carry skin parasites, such as scabies, fleas, lice or ticks. Of the diseases of man caused by the grosser animal parasites, echinococcus is the most serious. Although more than 350 cases have been reported for this country,[4] the actual number of infections is undoubtedly much greater. Practically the only primary host of the echinococcus is the dog.

* From the laboratory of Experimental Surgery and the Department of Entomology, University of Minnesota.
* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., May, 1925.

1. Hall, M. C.: The Dog as a Carrier of Parasites and Diseases, Bull. 260, U. S. Dept. Agric., Nov. 23, 1915.
2. Cameron, T.: The Dog as a Carrier of Disease to Man, Lancet **1**: 564 (March 18) 1922.
3. Joannides, Minas: The Relation of the Dog to Public Health, Minnesota Med. **8**: 302 (May) 1925.
4. Joannides, Minas; and Riley, W. A.: Echinococcus Cyst in the Scapular Area, Report of a Case, Arch. Surg. **9**: 537 (Nov.) 1924.

The fact that the disease is most prevalent in localities where the dog is in very intimate contact with human beings is a striking illustration of the rôle this animal plays in the transmission of human disease.

Cases of pulmonary tuberculosis in the dog have been reported. Müller and Glass [5] state that tuberculosis in the dog can be developed in one third of those inoculated experimentally. The dog apparently has greater resistance to tuberculosis than cattle. It is possible that the tubercle bacillus infecting the dog may be a distinct type. Be that as it may, the dog easily can carry human tubercle bacilli on its hair, paws or other parts of its body. Similarly, the dog may carry other infectious diseases, such as diphtheria, scarlet fever, measles and smallpox.

It is common knowledge that rabies is transmitted to man chiefly through the dog. Epidemics spring up in various parts of the world, chiefly because the dog is not controlled sufficiently to render it harmless.

It is not our intention to condemn the dog as the cause of numerous difficulties. It is the dog's master who is responsible because of his lack of education along the lines of prevention, and also because of neglect toward the animal. Our contention is that if a man likes a dog sufficiently well to make it a pet, he has a duty to perform in keeping the animal clean and training it to avoid contact with infected materials. The dog can be trained to do almost anything; therefore, it should be an easy task to teach it not to lick the baby's face or hands or take food from his plate. In the presence of infectious diseases, the dog should be quarantined with the rest of the household. Periodically, vermifuges should be given, this treatment best being carried out by the veterinarian. Similarly, the veterinarian can protect the dog's skin from infection with mange, ringworm or other skin diseases. Epidemics of rabies should be a danger signal and an indication to muzzle all dogs in the neighboring localities. Stray dogs should be disposed of. Castration may be resorted to as a means of keeping the dog at home, thus preventing, in a measure, the possibility of infection of the dog and secondarily of man. Finally, the dog should be treated as a dog and not as a human being.

Probable method by which Dipylidium infection usually occurs. From Riley and Johannsen's Handbook of Medical Entomology.

ABSTRACT OF DISCUSSION

DR. R. P. BATCHELOR, Palmerton, Pa.: We must acknowledge that the dog is a definite carrier of disease to man. Scarlet fever, diphtheria and other human diseases are known to have been spread by dogs. Human echinococcus and dipylidium infections have been traced to this source. The danger from rabies is ever present. But have we any scientific basis for believing that the common intestinal parasites of dogs are passed on to man? Puppies are notoriously full of such parasites, and their close companionship with children should cause widespread infection to them. Yet I think many of us in looking over our cases find rather interesting data. I have noticed that the children infected with intestinal parasites are in large part those with very unclean habits, and many of them give no history of close association with dogs. On the other hand, many children of families owing dogs, children who have been in constant intimate contact with these pets, have shown no evidence of any intestinal parasites on repeated stool examinations and in spite of the fact that the pets have been in many cases heavily infested. Perhaps the supposed bactericidal action of the dog's saliva may be a factor of safety in this matter.

DR. E. E. SMITH, New York: A case of a subconjunctival echinococcus cyst came to my attention in New York in the past winter in the eye service of Dr. George Ray Hare, which it was suggested might be of external origin and which may have reached the eyeball in the manner called to our attention this morning.

DR. H. F. SMYTH, Philadelphia: In the community in which I live we have had more or less rabies. There was one striking outbreak in which five or six dogs in the community were bitten and I think one person. The owner of a pet dog, a woman, came down in the morning, opened the front door, and noticed that her dog, who had been out, was acting queerly. She was afraid to let him in the house and left the dog out, and that dog ran through the town, biting a number of other dogs. The same idea of lack of responsibility is seen in the custom of people going away for a few days and leaving their pets on the town.

DR. WILLIAM J. HICKSON, Chicago: In the last week I have seen dogs imported from Ireland, a Russian wolfhound recently over, and police dogs from Germany, and I think we had better be on our guard against introducing forms of parasites they have in Europe that are not common here that might be carried by these dogs. Such investigation could be made in quarantine.

DR. OSCAR DOWLING, Shreveport, La.: I trust that we may soon have a law or regulation throughout the United States which will require that every owner of a dog shall pay $2 license for that dog, the money to be used for rabies vaccine and the employment of veterinarians to administer it. I understand that 50 cents would cover this charge; then 50 cents would be left for the town or county and 50 cents for the health department with which to carry on some other work. In Louisiana we have had occasion to send out many of these treatments. They cost us $20 each, and in some instances we have sent as many as ten or fifteen into a community where we have reason to believe $200 is more than all the dogs in that section are worth. I see no reason why we should not arrive at some arrangement by which we may protect the public.

DR. MINAS JOANNIDES, Minneapolis: There are three types of roundworms that are found in the dog and may be found also in man. These are, *Eustrongylus gigas*, *Trichinella spiralis* and some of the ascarids. Worms in the dog are so common that it is the unusual thing not to find them in the dog's intestine. Not all of these are necessarily pathogenic to man. I called attention to the excellent paper of Dr. Hall. Again I wish to refer to his paper because he writes extensively on this subject. As a carrier, the dog may act as an intermediate or a chief host. In some instances the intermediate host is the same for both man and dog. Such is the case of the dog flea that carries *Dipylidium caninum* both to dog and to man. With reference to the echinococcus cyst of the eye, the infection very likely was implanted through the blood or lymph stream in a manner similar to a case of echinococcus cyst of the scapular area reported by me in the *Archives of Surgery* in November, 1924. Rabies is prevalent because owners of the dog have more regard for their dog

5. Müller, G., and Glass, A.: Diseases of the Dog and Their Treatment, Ed. 4, Chicago, Alexander Eger, 1923, p. 302.

than they have for the general public. Dogs are allowed to run loose without any restriction. In Great Britain, any new dog that comes into the country is quarantined for six months before it is let loose. A regulation of this sort might be of some help in this country. I should like to emphasize again the importance of quarantining pet animals during the presence of a quarantined disease in the household. Under the present régime we keep children from school, but we allow the infected dog to play with children of the neighborhood and thus carry disease from that household. The point of emphasis in this paper is the necessity for the education of the medical profession and the public along these lines, rather than placing restrictions on the dog and its master by means of legislation. If we educate the public by having talks in churches, luncheon clubs and schools, and illustrate our points by means of lantern slides or specimens, I think the public will be favorably impressed. The method instituted by Dr. O'Brien at the University of Minnesota for exhibiting preventive medicine measures in a recent health exhibit is a very practical one.

STONES IN THE KIDNEY PELVIS

A NONOPERATIVE METHOD OF REMOVAL WITH THE AID OF THE CYSTOSCOPE

BRANSFORD LEWIS, M.D.
ST. LOUIS

To meet the requirements demanded by a person of the stone-forming habit may be very difficult. The patient concerned in this report was subjected to so

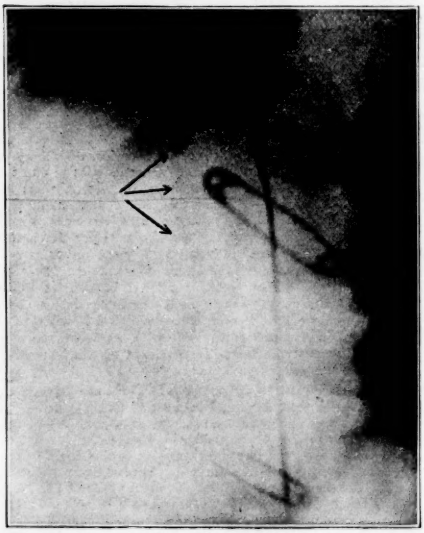

Fig. 1.—Stones in left kidney pelvis and catheter in left ureter, Dec. 21, 1923.

many operations for the removal of stones from both kidney pelves and ureters that further operative measures became a serious question. In view of his lowered vitality and the distressing after-effects of operations, something else had to be done.

REPORT OF CASE

F. K., a student, aged 22, who first consulted me in June, 1920, for a year had been having typical attacks of renal and ureteral colic on the left side, accompanied by the passage of bloody urine and occasionally a small stone. July 10, by

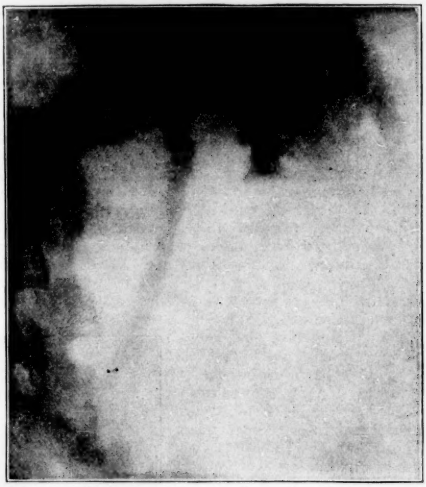

Fig. 2.—Dilated left kidney pelvis and ureter, March 6, 1923: stones gather in lower calix.

cystoscopy a stone was removed from the left ureteral orifice, after slitting with ureteral scissors.

The patient was placed on a meat-free diet, with forced fluids, and was apparently free from further trouble for nearly a year. But, in the summer and fall of 1921, the urine clouded again, and examination disclosed a stone the size of a hazelnut in the right kidney pelvis. No shadow or evidence of stone was found in the left kidney at this time.

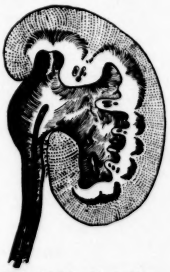

Fig. 3.—Natural position; stones in lowermost pocket.

November 9, under general (ether) anesthesia, a stone was removed with some difficulty from the right pelvis. It was so adherent that it was partly broken in the removal, but all the pieces were picked or washed out. On recovery the urine was again clear, and the wound was healed in a month. There was some excess of phosphates at this time. About March 23, 1922, the patient passed two small stones. April 15, cystoscopy and the roentgen ray showed some shadows of small stones in the left kidney pelvis, four of which passed after pelvic lavages and ureteral dilatings. Acid sodium phosphate and a preparation of hexamethylenamin were given internally.

March 5, 1923, stone shadows were again demonstrated in the left kidney pelvis, low down. One stone passed into the ureter in the next few weeks and was hung up there until removed by left ureterolithotomy on April 26. This stone was the size of a hazelnut. Irrigation through a retained ureteral catheter, slow convalescence and return home after many months of illness followed. November 15, cystoscopy and the roentgen ray showed one larger shadow in the right and two smaller ones in the left kidney.

November 28, right nephrolithotomy was performed. The patient was very anemic (red cells only 2,800,000) during this period, and was given a blood transfusion December 8, with benefit. But it was apparent that he could not stand more major operating, notwithstanding the presence of more shadows in the left kidney pelvis, the right being kept free and clear by frequent pelvic lavages.

It was at this time (Dec. 19, 1923) that I first put into effect the measure to be submitted. As may be seen by the roentgenogram (Fig. 2), the left pelvis and ureter were both well dilated, indicating that if a stone, even of considerable dimensions, were dumped into the pelvic end of the ureter, it would stand a good chance of passing through the ureter, the caliber of which had been enlarged by the use of bougies and dilators. Roentgenograms of this period (Fig. 1) showed several small shadows and one or two large ones in the lower calix which formed a pocket at the bottom of the left pelvis,

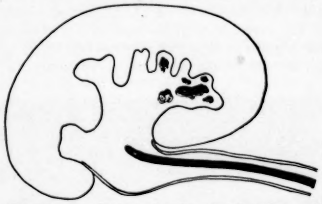

Fig. 4.—Changing the position, elevating the dependent pocket and lowering the outlet.

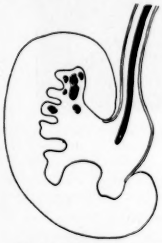

Fig. 5.—Further change in position, increasing the effect shown in Figure 4.

Fig. 6.—Pelvis and upper ureter filled with injected fluid providing for release and escape of stones.

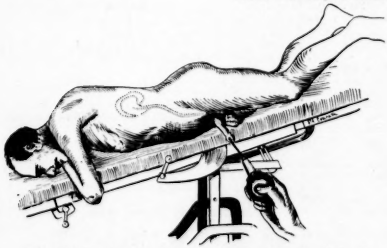

Fig. 7.—Injecting the pelvis while in the inverted position.

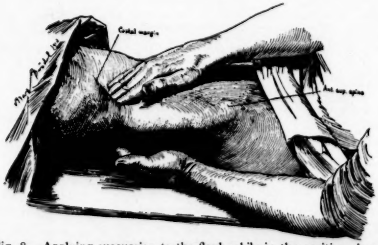

Fig. 8.—Applying succussion to the flank while in the position shown in Figure 7. (After Kelly and Burnham.)

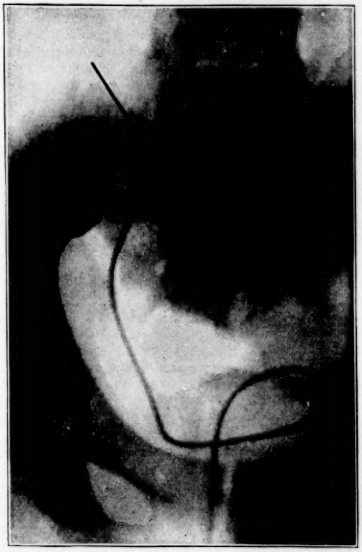

Fig. 9.—Good sized stone in left ureter at end of catheter, April 18, 1923.

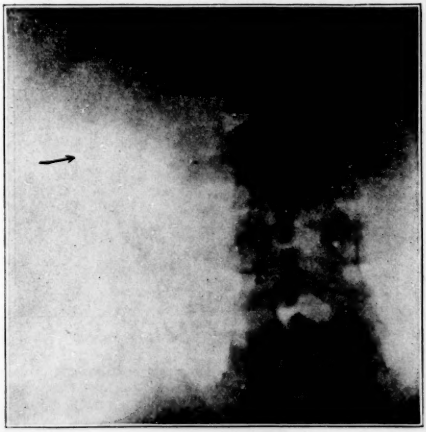

Fig. 10.—Two stones in lower calix of left kidney pelvis; March 18, 1924, removed by cystoscopy and shaking.

the most dependent location. Obviously, they were liable to remain indefinitely unless removed by active measures of some sort. It occurred to me that if the kidney could be turned upside down, so to speak, and the pelvis distended with fluid at the same time, both the release of the stones and their escape from the cavity might be promoted. This object might still further be enhanced by succussion movements and energetic massage applied to the affected kidney through the lumbar wall. The successive stages of these manipulations are shown diagrammatically in Figures 3 to 8. They were carried out for the first time on the morning of Dec. 19, 1923; and when the patient was dismissed he was told in jest that he would pass a stone at 3 o'clock that afternoon. On calling the next morning, I found the patient wreathed in smiles and much pleased in that at just 3 o'clock the previous day he had passed a good-sized stone, shown in the accompanying collection.

The succussion treatments were administered at intervals during the following year, with results so gratifying that about seventy-five stones have been evacuated; and during the last five or six months, both kidneys have been kept fairly clear of concretions.

A list of the treatments with their results is given in the accompanying tabulation.

The patient meantime has improved much in his physical and mental condition and has increased in weight; the urine has been much clearer than formerly, synchronizing with the roentgen-ray evidence, which for several months has failed to show stone shadows on either side. But, notwithstanding this fact, small concretions have been brought down on numerous occasions by the treatments, although they were not shown by the roentgen ray. They have been too small to be shown by the ray. While that does not speak altogether well for the accuracy of the ray, it does support the efficiency of the treatments, since all such concretions, if left in, would grow and in time become demonstrable by the ray and also produce their destructive effects on the kidney. As it is, the patient is in better general and local condition now than he has been during my previous acquaintance with him (five years).

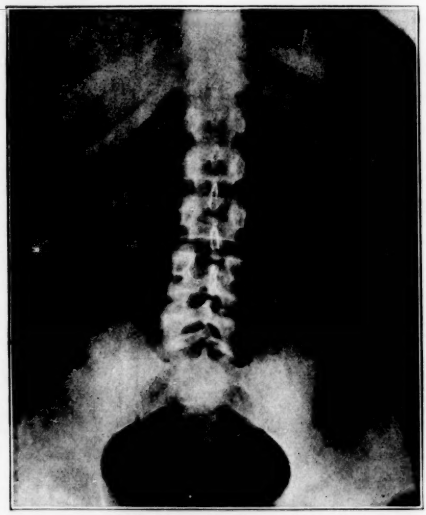

Fig. 11.—No stone shadows, after succussion treatments.

COMMENT

It will be noted that a considerable number of the stones thus removed are of very good size.

It is realized that other questions might be brought up, as to the propriety of elevating or replacing the kidney to favor drainage—methods of doing away with the stone-forming habit, etc.—but these questions will not be taken up in this presentation. I merely wish to describe a nonoperative method of removal of stones from the kidney pelvis that has given gratifying success and relieved a tense situation.

Fig. 12.—Stones from the kidney pelvis, removed during the year 1924 by cystoscopic succussion methods.

FINDINGS, TREATMENTS AND RESULTS

Cystoscopy and Succussion	Results
1. Dec. 19, 1923, 8 a. m.	Dec. 19, stone passed 3 p. m.
2. Dec. 24, 1923, 8 a. m.	Dec. 26, one stone passed
3. Dec. 28, 1923, 8 a. m.	Jan. 2, 1924, two stones passed
4. Jan. 8, 1924.....	Jan. 10, large stone passed
5. Jan. 16, 1924.....	No stone passed
6. Jan. 23, 1924.....	No stone
7. Jan. 27, 1924.....	No stone
8. Feb. 1, 1924.....	No stone; irrigation fluid returns clearer
9. Feb. 6, 1924.....	Feb. 9, one small stone after two days' colic
10. Feb. 11, 1924.....	Feb. 14, two small stones
11. Feb. 14, 1924.....	Feb. 16, one small stone
12. Feb. 20, 1924.....	None
13. Feb. 23, 1924.....	None
14. Feb. 26, 1924.....	None
15. March 1, 1924.....	March 2, one stone
16. March 10, 1924.....	None
March 18, 1924.....	Roentgen ray showed three stones in left pelvis
17. March 21, 1924.....	March 21, one stone
18. March 25, 1924.....	None
19. March 27, 1924.....	March 28, two stones
20. April 1, 1924.....	None
21. April 6, 1924.....	None; goes home
22. May 6, 1924.....	May 6, one stone
23. May 11, 1924.....	May 13, one stone
24. May 16, 1924.....	None
25. May 21, 1924.....	May 21, colic same day; required four days for passage of largest calculus, May 25
26. June 3, 1924.....	None
27. June 19, 1924.....	None
28. July 2, 1924.....	July 2, two stones
29. July 18, 1924.....	Roentgen ray showed two small shadows lower pole left kidney pelvis; large shadow absent
30. Aug. 1, 1924.....	None
31. Aug. 18, 1924.....	Aug. 23, one stone after two days' colic
32. Aug. 26, 1924.....	Catheter and roentgen ray; one shadow, left pelvis
33. Aug. 30, 1924.....	Succussion treatment; no stone
34. Sept. 10, 1924.....	None
35. Nov 10, 1924.....	None
36. Nov. 15, 1924.....	Nov. 16, one stone
37. Dec. 15, 1924.....	Dec. 17, one stone
38. Jan. 20, 1925.....	Colic three days; large stone passed, Jan. 24
Jan. 25, 1925.....	Tonsillectomy
39. Feb. 3, 1925.....	None
40. March 10, 1925.....	Roentgen ray showed no shadows; urine drained clear
41. March 20, 1925.....	Roentgen ray failed to show shadow; March 23, small stone passed
42. April 2, 1925.....	April 4, colic; April 5, fair sized stone passed
43. April 7, 1925.....	April 7, shower of small stones (about ten) passed within two hours after succussion treatment

The transit of a stone is described by the patient as follows: After feeling bad, with headache, nausea, nervousness and sleeplessness for three days, cystoscopy was done and succussion treatment given, March 20, 1925, at about 8 a. m. While considerable relief from the symptoms appeared on the same day, it was not until the following morning at about 8 o'clock that the patient felt the stone moving down the ureter. This he said he distinguished with certainty, the stone passing through the entire ureter in the space of about thirty minutes. On the stone escaping from the ureter into the bladder, the patient felt instant and complete relief. The stone passed from the bladder at the second urination after its entrance into that organ.

Clinical Notes, Suggestions and New Instruments

A SIMPLE SPLINT FOR BASEBALL FINGER

PHILIP LEWIN, M.D., CHICAGO

This is a simple splint which I have found very effective. It is useful in the treatment of baseball finger, mallet finger[1] or "drop phalangette,"[2] and arthritic flexion of the end phalanx. The principle may be useful in the treatment of hammer toe.

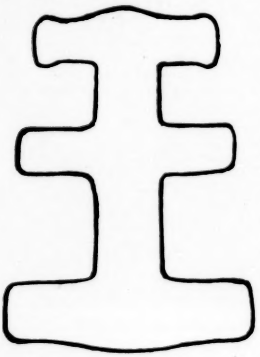

Fig. 1.—Pattern for splint.

It is made of aluminum, although duralumin, copper, brass, German silver or silver may be used. It is very light, self-retaining and easily adjustable to any position, including hyperextension. It is permeable to the roentgen ray, can be immersed in water, and is inexpensive. The splint can be made to fit so snugly that it must be "soaped" or wet to be removed, like a tight band ring. It can be worn under a glove, and one of my patients drives her car while wearing it.

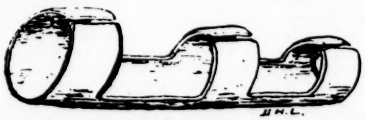

Fig. 2.—Splint.

Fig. 3.—Splint applied.

A pattern is made as shown in Figure 1. The pattern is then shaped to that of Figure 2 and applied as in Figure 3. During the latter part of the treatment, each patient should have two splints; one unlined to be worn if the hand is to get wet; the other lined with chamois for the dry hand.

Fig. 4.—Flexion deformity of distal phalanx; "drop phalangette."

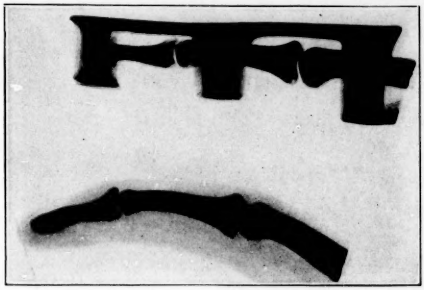

Fig. 5.—Finger with and without splint.

7 West Madison Street.

1. Wilson and Cochrane: Fractures and Dislocations, 1925, p. 319.
2. Stern: Am. J. Orthop. Surg. 6: 484 and 518, 1908-1909.

RECURRENT CARCINOMA OF BREAST, WITH ROENTGEN-RAY FIBROSIS *

HAROLD SWANBERG, M.D., QUINCY, ILL.

Mrs. B., aged 48, referred to me, June 8, 1920, by the Mayo Clinic, for postoperative roentgen-ray therapy for carcinoma of the breast, had not had any serious previous illness, except diphtheria when a child. Her general health had always been good. She had no children. In October, 1918, she noted a small lump in the right breast, which was about the size of a quarter and was not associated with any pain. She immediately consulted a physician, and two days later had the whole breast removed, but did not have any of the axillary glands dissected, for a radical operation was not thought necessary and was not contemplated unless a pathologic examination revealed malignancy. Sections made from the growth removed were reported nonmalignant. In March, 1920, she noticed a small nodule in the skin of the right axilla. This was removed and found to be malignant. She then went to the Mayo Clinic, where a radical breast amputation was done, April 12. What the Mayo Clinic thought of the case can be judged by the following extracts from a letter received May 3, 1920:

"Mrs. B. came to us, April 7, with a recurring carcinoma of the right axilla following amputation of the breast elsewhere in October, 1918. She was operated on here, April 12, at which time Drs. C. H. Mayo and Pemberton excised the scar of the old breast amputation, including all of the pectoralis minor and all except the clavicular attachment of the pectoralis major, and dissected out the nodes in the right axilla, which were extensively involved. The junction of the sternum and the first rib on the right side was nodular and slightly enlarged; the tissue around this point was adherent but was hard and bonelike, and no specimen could be removed. It is possible that this is bony metastatic malignancy.

* Read before the Central Illinois Radiological Society, Quincy, Ill., May 19, 1925.

"She received one roentgen-ray treatment here, April 26, and as she expects to visit in this vicinity for some time she will probably receive her second treatment here also. On her return home we have advised her to consult you for

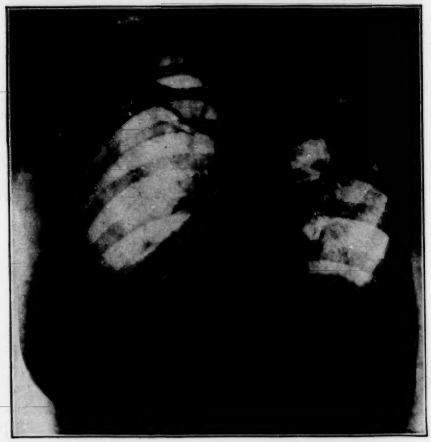

Fig. 1.—Condition of chest, Sept. 22, 1922.

further treatments, although the ultimate prognosis is most unfavorable."

After having several series of roentgen-ray treatments at the Mayo Clinic, the patient reported to me, June 8, 1920, for postoperative roentgen-ray therapy. A course of treatment was administered and repeated in July, September, December

Fig. 2.—Condition of chest, Dec. 29, 1922.

and the following March and June. The treatment consisted of the usual one that roentgenologists were administering at that time. It consisted of exposures of multiple small skin areas, a 9½ inch gap, 5 milliampere current and 7 inch skin distance being used, with 4 mm. of aluminum and a piece of sole leather as filters. The time factor averaged about eight minutes. Later the filter was increased to 5 mm. of aluminum and the distance to 8 inches. While no roentgenographic examination of the chest was made at first, several fluoroscopic examinations were made, and all were negative. As the result of the roentgen-ray treatment, the patient experienced some very severe skin reactions. In fact, they were so marked as to give me considerable concern, for I felt that the patient was unduly susceptible to the rays. On one occasion a distinct skin reaction appeared on the posterior section of the chest a day after several treatments had been administered on the anterior surface. Jan. 4, 1922, I felt that enough radiation had been administered, but further correspondence with the Mayo Clinic advised me to continue to give a series of treatments every three or four months; therefore, an additional series of treatments was administered in January and May, 1922. These series consisted of two large areas of exposure, anteriorally and posteriorally over the right chest and axilla, with a 10½ inch gap, 5 milliamperes, 12 inch skin distance, and 6.5 mm. aluminum and a piece of sole leather as filters, with fifteen minutes time for each area. About April, 1922, the patient developed a cough, which was dry. She had no dyspnea or pain. The cough

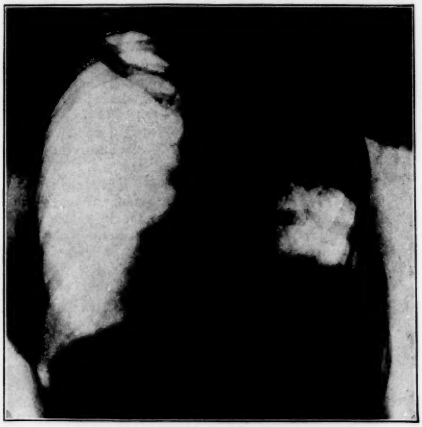

Fig. 3.—Condition of chest, May 16, 1925.

lasted all summer and did not disappear until about September. During this period, however, she was feeling fine and was steadily gaining in weight. September 22, the first roentgenograms were made, followed by an additional examination, December 29, and a third examination in May, 1925. The date of the last roentgen-ray treatment was May 23, 1922.

The roentgenograms clearly show a marked fibrosis present in the right chest. In fact, practically no lung tissue is apparent in the upper half of the right chest at the last examination. The diaphragm is elevated on this side; the ribs are more oblique, and a distinct scoliosis is present. The left lung presents a distinct compensatory emphysema, the only portion of the right lung that is aerated being a small part at the base. The films also demonstrate that the condition is not clearing up; in fact, the density was more marked at the last examination. Clinically, however, the patient enjoys excellent health and the lung fibrosis apparently gives her no concern. The cough has disappeared, and there is no dyspnea or pain. A very marked telangiectasis is present nearly all over the chest, but there is no clinical evidence of any recurrence of the original growth. Needless to say, the patient is extremely grateful in view of the grave prognosis originally made.

731 Hampshire Street.

TUMOR OF THE BODY OF THE PANCREAS *

JACOB BUCKSTEIN, M.D., NEW YORK

Consultant in Gastro-Enterology, U. S. Veterans' Bureau; Assistant Roentgenologist, Bellevue Hospital (in Charge of Gastro-Intestinal Roentgenology); Assistant Attending Physician, New York Polyclinic Medical School and Hospital

The accurate clinical diagnosis of tumor of the body of the pancreas is sufficiently difficult to warrant the report of clear evidence on which such a diagnosis may be based. This

Tumor of the body of the pancreas, indicated by arrows.

evidence is roentgenographic. As noted in the accompanying roentgenogram, the stomach, in addition to being displaced upward, shows a smooth crescentic defect involving the greater curvature. There is also downward displacement of the small intestine. On this indirect evidence, a diagnosis of tumor of the body of the pancreas was made. This was verified on surgical exploration by Dr. Arthur M. Wright, visiting surgeon to Bellevue Hospital. The tumor was a large pancreatic cyst.

PRIMARY TULAREMIA OF THE EYE

MALCOLM C. PFUNDER, M.D., MILES CITY, MONT.

The paucity of reported cases of tularemia with the primary infection in the eye makes it seem desirable to add one more to the four that have been reported by Vail, Sattler and Lamb of Cincinnati, and Martin [1] of Phoenix, Ariz.

REPORT OF CASE

W. C. F., aged 63, a farmer, who consulted me, April 11, 1925, noticed several wood ticks on the horses while harnessing his team, April 6. He removed these with his fingers, and while so doing a foreign body was blown into his left eye; he removed this with his finger. April 8, what he described as a "pimple" appeared on the conjunctiva of the lower lid of the left eye, and a marked swelling appeared just in front of the left ear. April 11, when he appeared for treatment, there was tremendous swelling extending from the superciliary region to the upper lip, and backward to the ear, the lids being so swollen that the patient was unable to open the eye. The bulbar conjunctiva was so swollen that it hung downward from above and extended upward from below so that the cornea was seen only through a slit 3 mm. wide. On the palpebral conjunctiva of the lower lid there were two small ulcers about 2 mm. in diameter. Smears made from the conjunctiva showed many pus cells but no organisms. The temperature was 101 F. when first observed; no white blood cell count was done. April 14, the chemosis became so marked that the cornea became "steamy" in appearance. The patient was then hospitalized, and continuous hot applications were used on the eye. Under this treatment the swelling about the eye diminished considerably, and the cornea became more normal in appearance, but the bulbar conjunctiva remained markedly swollen. As the edema of the left side of the face disappeared a ridge, extremely hard and about 2 cm. high became visible, extending from the outer canthus to the preauricular lymph gland. This gland meanwhile had continued to enlarge until it was as large as a hen's egg and very hard. The eye continued to improve, and, April 24, the patient went home against my advice. The right eye remained entirely normal.

April 25, the article by Francis [2] appeared; and, seeing a similarity between this case and those reported from Cincinnati, I drove to the patient's home, 60 miles away, to observe his surroundings and to obtain a specimen of blood from an agglutination test. From the window of the house a view could be obtained of a long, gentle slope on which many small, white spots could be seen. These proved to be the bodies of rabbits of the so-called "Jack" variety, all dead from natural causes. It is interesting to observe in this connection that people who have lived a long time in Montana, those who like to be called "old timers," all tell about a periodic epizootic among the rabbits, which appears about once in seven years and kills them by the thousand. In the light of modern knowledge, it seems quite probable that this epizootic is tularemia. A search was made in the sagebrush for the common Montana wood tick, *Dermacentor andersoni* Stiles, but unfortunately the day was cold and none were found, though the patient informed me that many could be found on warm days. A specimen of the patient's blood was drawn into a Keidel tube, and after returning to the office, I mailed the serum separated and diluted with an equal amount of neutral glycerin, to the Hygienic Laboratory of the U. S. Public Health Service, Washington, D. C. May 2, a wired report stated, that the serum was positive for tularemia in a dilution of 320.

Appearance of patient with primary tularemia of left eye with secondary involvement of preauricular lymph gland, forty days after onset of illness.

May 18, I again visited the patient. The eye was considerably improved, though there was still considerable chemosis. The preauricular lymph gland was even larger than before and had begun to soften in three areas, giving a distinct sense of fluctuation. Photographs showing the enlarged gland and the thickening along the course of the lymphatics, from the eye to the preauricular gland, were taken on the occasion of this visit, forty days after the onset of the disease. At this time the patient's temperature was 99.6 F.

* From the Radiographic Department, Bellevue Hospital, Dr. I. S. Hirsh, director.

1. Martin, Ancil: Tularemia Infection of Conjunctiva (Case Report), Southwest. Med., June, 1925.

2. Francis, Edward: Tularemia, J. A. M. A. **84**, 1243 (April 25) 1925.

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SATURDAY, OCTOBER 3, 1925

LIVER FUNCTION TESTS

The proposal to employ the quantitative measurement of urobilin, or its precursor urobilinogen, in the urine as an aid to diagnosis is not a new one. Urobilinogen is almost invariably present in the urine of man. Urobilin rarely, if ever, appears in the freshly voided urine; but it can readily be formed from its antecedent, so that the two closely related substances may be regarded as having a common history and significance. Fortunately, there are fairly satisfactory methods for the quantitative estimation of these pigmentary compounds. Their application has shown that large variations occur in the output of urobilinogen in the urine; and it has been the study of these that has raised the question of their possible diagnostic significance. The literature of the subject reveals an alternation of enthusiasm and doubt. Not a little of the uncertainty is attributable to the conflict of opinion regarding the genesis of the urobilinogen.[1] Most writers have followed the leadership of Friedrich Müller in attributing to urobilinogen an enterogenous origin. According to this conception, bilirubin, entering the intestine, undergoes gradual changes and eventually becomes transformed, through bacterial changes in the intestine, into urobilinogen. Micro-organisms are thus made to play a part in the genesis of the compound. The belief that urobilinogen may be formed in the kidney, through reductive processes occurring in that organ, appears to have been definitely disproved. The same could not be said regarding other nonenterogenous theories until recently.[1] If further evidence were needed in substantiation of the intestinal origin of urobilinogen, it could be found in the observations of Wallace and Diamond[2] of New York. They show, through experiments on animals, that in exclusion of bile from the intestinal canal by ligation and excision of the common duct, urobilinogen does not appear in the urine, even though the liver may be severely damaged. When, however, the flow of bile is reestablished by anastomosis between the gallbladder and the duodenum, or when bile is administered by mouth, urobilinogen again makes its appearance. The finding of small quantities of the substance in the intestinal canal after occlusion of the common duct is easily explained by the demonstrated excretion of bilirubin from the general circulation directly through the intestine, where the bile pigment becomes converted into urobilinogen through the subsequent bacterial transformations.

Until the opponents of the enterogenous theory can marshal more convincing evidence, it may be accepted as a working hypothesis. Experimentally, it has been found by Wallace and Diamond that in parenchymatous changes of the liver there occurs a marked increase in the urinary output of urobilinogen. If this means, as we may properly suppose, that the reabsorbed urobilinogen is not properly mobilized by the damaged liver and hence is eliminated from the blood by the kidneys in greater than usual amounts, the increased output truly is an indication of hepatic disorder. In harmony with this, it has been observed that the pathologic conditions in which urobilinogen is eliminated in excessive amounts can be classified in two main groups. One of these comprises diseases of the liver and biliary tracts—conditions showing acute and subacute hepatic changes or exacerbations associated with chronic processes. In the course of the slowly progressive chronic liver lesion, the output of large amounts of urobilinogen is said not to be constant. This is probably attributable to the ability of the organ to perform its normal metabolic function by compensatory growth of new liver tissue. The other group of diseases characterized by large urobilinogen output comprises hemolytic disturbances in which the outcome is due to the increase in the formation of bile pigment and a consequent relative insufficiency of the liver.

Facts such as the foregoing represent the possible basis for the choice of the "urobilinogen test" in the interpretation of liver disorders. The inevitable limitations of such aids to diagnosis should be frankly recognized. As Wallace and Diamond point out, any functional test designed to measure liver abnormality must be limited in its application and interpreted with great caution in terms of liver function. In any disease of the liver, they add, it is unlikely that all functions are deranged or at least equally involved; and, furthermore, there is no known single test that measures hepatic function as a whole. Bearing these shortcomings in mind, the New York clinicians advocate the use of the urobilinogen test as a routine laboratory measure in all urine examinations. We are assured that in icterus or in latent icterus, in hepatic disorders, in the anemias, in malaria, in infections, in malignancies and in intoxications it will supply an important adjuvant in the routine diagnosis, and will often aid in the interpretation of intricate and obscure clinical conditions.

1. The Origin of Urobilin, editorial, J. A. M. A. **85**: 518 (Aug. 15) 1925.

2. Wallace, G. B., and Diamond, J. S.: The Significance of Urobilinogen in the Urine as a Test for Liver Function, with a Description of a Simple Quantitative Method for Its Estimation, Arch. Int. Med. **35**: 698 (June) 1925.

Thus, the constant presence of urobilinogen in catarrhal jaundice, and its total absence in mechanical icterus, such as is encountered in carcinoma of the head of the pancreas and of the biliary tract, forms a marked distinguishing diagnostic feature between the benign forms of jaundice and those due to malignant causes. The urobilinogen test does not always coincide in its character with the recently much vaunted test with phenoltetrachlorphthalein. Wallace and Diamond remind us, in this connection, that retention of the dye does not necessarily indicate a deficiency in the performance of the normal metabolic function of the liver, but merely points to a lessened capacity of this organ to eliminate foreign substances. The newer technic for the urobilinogen test brings it within the scope of any clinical laboratory.

CHEMICAL WARFARE

"The pacifists," said General Fries [1] in a recent address, "are the fundamentalists of international relations. They won't believe half what they see, nor anything they hear that is based on history." Beginning with Cain's destruction of Abel by the use of a club, warfare has progressed through the Greek phalanx, the Roman legion, the spear, the bow and arrow, the battle ax, the sword and armor of steel to cavalry, to gunpowder and explosives, to "tanks," aeroplanes and the so-called war gases. Each of these innovations was met with cries of horror by ardent pacifists who felt that man's inhumanity to man was becoming quite too inhumane.

As indicated by General Fries, nations never hesitate in times of war to use any weapons for offense or any methods of defense that science or ingenuity can provide. The United States, on the advice of John Hay and Admiral Mahan, refused to sign the Hague agreement on war gases. Hay realized that violation by a single nation rendered such an agreement nugatory. And when Germany began the use of gas in the World War, all other nations quickly followed.

Those most familiar with the actions and properties of war gases contend that their use is more humane than that of explosives. While gas produced many casualties in the war, records of the Surgeon General's Office indicate fatalities only about one twelfth of those resulting from wound-producing agencies.[2] The argument is made that once the use of such methods is conceded, science will go on to more and more terrific weapons. To this the chemists answer, as does Haldane [3] in his notable essay, "Chemistry and Peace," that we have apparently reached our limit because more powerful explosives would be as dangerous to the users as to those against whom they might be employed. And it must be remembered that when more efficacious methods are discovered, sooner or later some nation, fighting a war which it has convinced itself is a righteous war, will use that method. Has there ever been recorded a conflict in which each contending nation did not feel that it fought on the side of truth and morality and righteousness?

Haldane is convinced also that it is unlikely that more poisonous gases will be found than those we now have, and that the respirators used in gas defense are adequate in protection. Far more probable, he believes, is the development of skin irritants more unpleasant than mustard gas. The whole argument of the great British chemist is not for war or for chemical methods of warfare, but for increasing study and knowledge of chemical methods and for the best application of that knowledge for the good of man. With this argument for preparedness and research, none can wisely disagree.

1. Fries, Amos: Evolution in the Army, an address before the Chemical Warfare Association Meeting, Chicago, Sept. 24, 1925.
2. Vedder, E. B.: The Medical Aspects of Chemical Warfare, Book Notices, this issue, p. 1083.
3. Haldane, J. B. S.: Chemistry and Peace, Atlantic Monthly **135**: 1 (Jan.) 1925.

ANHYDREMIC ACIDOSIS

The treacherous features of that somewhat insidious entity known as anhydremia have begun to receive more serious consideration as the frequent occurrence of the condition is becoming recognized.[1] In poisoning with war gases, the concentration of the blood develops as a significant symptom. Influenza and the attendant pneumonias have furnished illustrations of its consequences. A critical point in the management of extensive superficial burns arises when the circulating fluid concentrates. Probably the most frequent occurrence of anhydremia is in infancy when diarrhea and vomiting contribute to the retrenchment of the circulation in fluid. The manifestations themselves have been fairly well recognized; the relief brought by the therapy of fluid replacement is readily understood; but the more intricate features of the dehydration that engender severe symptoms are all too little understood.

Fundamental among them doubtless is the necessarily impaired circulation that must, in not a few instances, lead to impoverishment of the tissues in oxygen, just as severe hemorrhage may. One consequence Clausen [2] has clearly demonstrated to be an acidosis due in large measure to lactic acid. The latter is regularly formed in the course of muscular contraction, being removed during the period of rest by local oxidation, by resynthesis to some more complex tissue component, such as glycogen, or by transport to other metabolizing organs. The quantity in actual circulation is minimal, and little is eliminated in the excreta. As Clausen points out, under normal conditions of activity, circulation and oxygenation, the removal of lactic acid from

1. Diarrhea and Anhydremia in Infancy, editorial, J. A. M. A. **76**: 794 (March 19) 1921; Anhydremia and Fever, ibid. **79**: 218 (July 15) 1922.
2. Clausen, S. W.: Anhydremic Acidosis Due to Lactic Acid, Am. J. Dis. Child. **29**: 761 (June) 1925.

the seats of its origin is so rapid that the alkali reserve of the body as a whole remains practically unaffected. Whenever the circulation or the processes of oxidation become insufficient, the rate of removal of lactic acid will be less than its rate of production, so that the concentration in the blood will rise, and the alkali reserve of the tissues (including the blood plasma) will fall. As soon as the rate of production of lactic acid exceeds the rate of its removal by even the normal mechanism, lactic acid acidosis may result.

This happens, as Clausen demonstrated, in children in cases of cardiac decomposition for obvious reasons. With improvement of the circulation, the lactic acid promptly disappears from the blood. It has now been observed in the anhydremia so characteristic of "alimentary intoxication," lactic acid joining with retained acid phosphate and perhaps other organic acids to provoke the lowering of the alkali reserve—the true acidosis. It is a significant fact that ketosis (in which beta-hydroxybutyric and aceto-acetic acids arise) is not conspicuous in cases of lactic acid acidosis. The acidosis due to the ketone substances is best relieved by glucose and insulin, which overcome the carbohydrate starvation that induces it. Lactic acid acidosis is adequately relieved by treatment of the underlying circulatory condition. Fluid to overcome the anhydremia is the foremost requisite. Alkalis may be a menace, leading to edema or tetany through alkalosis. Intravenous or intraperitoneal infusions of replacement fluid may be life-saving.

THE AMERICAN PHYSICIAN IN FACT AND IN FICTION

Criticism of the medical profession is, in some places, a favorite "indoor sport." On the one hand, the physician may be charged with remaining aloof from public affairs and his share of responsibility for the civic welfare of his fellow men; in another quarter, he may be assailed for undue intervention and for interference with the much vaunted "personal liberties" of his compatriots.

The critics are wont to forget that the art of medicine and the practitioner of any generation represent the outcome of evolutionary changes. From the earliest times, medicine has been a peculiar blend of superstition, empiricism and "that kind of sagacious observation which is the stuff out of which ultimately science is made." In the New World there came a demand for physicians long before there existed facilities for their proper training or means for their proper support. Only in comparatively recent times have the hospital and the university become adequately available in America for training in medicine. Changes in our educational system have naturally not progressed far in advance of the social system and novel economic conditions that this country has presented.

Perhaps a better realization of the unusual environment in which medicine was forced to develop in America from colonial times until quite recently would soften the asperities of the present day critic. The history of medicine in America with its apprenticeship system and the lack of the continental type of education may at any rate serve to explain, if it does not excuse, some of the "crudities" of the earlier days. In discussing the effects of the rapid expansion of population over an enormous territory, Flexner [1] has presented a vivid picture of the consequences on the medical profession. The inevitable happened. Loose and shifting bands of practicing physicians, calling themselves a faculty, tried to impart, chiefly by lectures, to heterogeneous, uneducated groups of students the empiric knowledge—sound and unsound—which they themselves possessed. First and last, Flexner states, American towns have produced more than 400 such medical schools. The teaching of medicine on these terms was directly, in cash, and indirectly, in prestige, a profitable business. In time the medical profession—to its credit be it said—undertook itself to set its own house in order, and with such marked success that schools of this extreme type have within the last decade practically disappeared.

The critic and the reformer are by no means ready, however, to let bygones be bygones. Thus, Flexner remarks: "The medical profession now knows better; but large sections of the people have not yet unlearned the bad lesson they were then taught; so that medical sectarians employing a technic compounded of illusive promises, bragging and advertising operate profitably on a scale that would have amazed, perhaps even shocked, the regular profession in the heyday of proprietary medical education." Amid such circumstances it is refreshing to read a worth-while tribute to the country doctor, such as the late Vice President Thomas R. Marshall has published in his "Recollections" [2] regarding his father.

> I think, if service is to be the true mark of greatness in a people, all these other wonders of a wondrous age and state must pale into insignificance beside the service and sacrifice of the country doctor. Who now remembers the conditions under which he sought to minister to minds and bodies diseased? Who now, by any stretch of the imagination, can bring to view the awful roads, the inhospitable houses that were called homes, the lack of furnaces, bathrooms, hot water, electricity, gas; mud everywhere; cracks in the houses everywhere; children waking in the morning with their blankets covered with snow; huge fireplaces where you roasted on one side and froze on the other? And add to it all a malarial climate. Chills and fever—fever and chills. Day in and day out, night in and night out, storm and sunshine, the country doctor went his rounds.

Here is a heartfelt appreciation of a real American physician. Who shall deny that he was the prototype of many of the pioneers of our profession in the New World?

1. Flexner, Abraham: Medical Education, New York, the Macmillan Company, 1925.
2. These have appeared serially in the New York Times, September, 1925.

Current Comment

SINGLE INJECTION METHOD OF VACCINATING DOGS AGAINST RABIES

Japanese investigators, in 1921, found it possible to immunize dogs against rabies by a single subcutaneous injection of glycerinated fixed virus that had been attenuated by the addition of phenol (carbolic acid), and their work was confirmed [1] in this country. It appears now, from more recent investigation,[2] that the single injection vaccine does not protect dogs against a certain strain of street virus. In response to many inquiries, the U. S. Bureau of Animal Industry conducted experiments on dogs, using single injection vaccine made from the strain of fixed virus which originated in the Pasteur Institute of Paris, and from which commercial vaccines in this country are said to be made. The dogs were injected with different strains of street virus by the intra-ocular route. The vaccine afforded distinct protection against two different strains of street virus, and twelve among the sixteen dogs thus inoculated survived. Against a still different strain of street virus, designated B. A. I. 474, there was practically no protection afforded and only six among the thirty dogs inoculated survived. These experiments indicate the existence in this country of more than one strain of rabies street virus. Apparently there is a strain against which the single injection vaccine affords little protection; if this observation is confirmed, a vaccine that immunizes against B. A. I. 474 virus as well as against the strain heretofore encountered will be required.

THE NEED OF CALCIUM

Much has been written of late regarding the importance of appropriate fat-soluble vitamin in the metabolism of calcium in the body. Recent experimental studies on rickets have shown in striking manner how the addition of surprisingly small amounts of such sources of the vitamin in question as cod liver oil, or of far smaller quantities of potent concentrates from cod liver oil, promotes the successful deposition of lime in the bones under dietary conditions that lead to serious osseous defects if no remedial factor is furnished. Sunlight and suitable artificial irradiation also may act to facilitate the retention of calcium under certain otherwise unfavorable conditions. Amid our enthusiasm for these discoveries we are liable, however, to overlook the fact that disturbances in the mineral metabolism may be due to a deficiency of the mineral element in question quite as well as to a lack of the factor aiding mineral assimilation. This has been emphasized in a striking way by recent animal experiments of Sherman and MacLeod [3] of Columbia University. They have shown that under certain conditions of what might be termed suboptimal nutrition—conditions such as are presumably encountered in human experience—a sufficiently liberal allowance of calcium in the food is of prime importance to the optimal storage of calcium, for animals may be able to grow on diets on which the resulting calcium content of the body falls below the normal for their weight and age. In such cases, supplements of calcium in suitable forms, rather than fat-soluble vitamins, may be the determining factor in enriching the calcium depots of the organism so that they approach optimal conditions. Animals that receive little calcium in their diets lose calcium from their bodies. The drainage that pregnancy and lactation may bring about in respect to this element is shown by the lowering of the percentage of calcium in the body as the result of bearing and suckling young. Hammett [4] believes that there are sex-specific differences in the course of differential development and that they can be traced to gonadal influences. The relation of deposition of inorganic matter to bone growth by increments in organic matter and water, he finds, is different in the male than in the female. While in the one sex there is an apparent uniformity in type of growth impulse with age, in the other some factor exerts an influence on growth by ossification independently of the general stimulus to growth by increments of organic matter and water. In other words, there is apparently an independent factor for ossification in the female which is not exhibited in the male. In both sexes, however, apparently "normal" nutrition may be far from optimal when the supply of calcium is not itself optimal. Such conditions of suboptimal calcium storage are not easily detected except by elaborate analytic investigation not always possible in man. The lesson is clear: The calcium supply should be measured with liberality wherever doubt exists. Growth, pregnancy and lactation represent conditions of unusual demand that the body struggles to satisfy from one source or another. They should not be permitted to develop a hidden weakness in the organism.

GROWTH IN MENTAL MEDICINE

During the century ending with 1920, some 37,981,462 immigrants arrived in the United States, almost 70 per cent. of them in the last forty years. In these four decades, the number of persons in public institutions for the treatment of mental disease in the United States increased almost 600 per cent., or, according to Treadway,[5] from 40,942 to 232,682. The obvious conclusion is to trace a direct relation between the enormous increase in immigration and the increase in the number of patients in mental hospitals. In 1920, Pollock and Furbish found that 33 per cent. of the first admissions in seventy-one state hospitals for mental disease were foreign born patients. Of all white persons admitted to public institutions for the insane in 1910, 25.5 per cent. were foreign born. In 1920 there were 13,920,692 foreign born persons in

1. Prophylactic Vaccination of Dogs Against Rabies, Current Comment, J. A. M. A. **78:** 1898 (June 17) 1922.
2. Schoening, H. W.: J. Agric. Res. **30:** 431 (March 1) 1925.
3. Sherman, H. C., and MacLeod, F. L.: The Calcium Content of the Body in Relation to Age, Growth and Food, J. Biol. Chem. **64:** 429 (June) 1925.
4. Hammett, F. S.: A Biochemical Study of Bone Growth, I. Changes in the Ash, Organic Matter, and Water During Growth (Mus Norvegicus-Albinus), J. Biol. Chem. **64:** 409 (June) 1925.
5. Treadway, W. L.: Mental Hygiene, with Special Reference to the Migration of People, Pub. Health Bull. 148, U. S. P. H. S., 1925.

continental United States. Less than half of these were naturalized and less than one in ten had declared their intention of becoming citizens. Our immigration laws previous to 1920, therefore, permitted an influx of immigrants who did not intend to become citizens and of many who were mentally unstable. Immigration was, of course, only one large factor filling up our asylums. While the new immigration law of 1924 may greatly reduce the rate of admissions to mental hospitals, another preventive measure, the mental hygiene movement, has become widespread, and various scientific societies have been organized to study mental problems. In his presidential address before the American Psychiatric Association, Dr. William A. White [6] reviewed in part the last thirty years of mental medicine and made a number of recommendations. He advocated that the six separate organizations now especially concerned in mental medicine unite and establish one strong national organization with permanent headquarters that would function every day in the year. The proposal is timely. Closer cooperation is needed, if for no other reason than to keep the control of the mental hygiene movement among those who know most about mental medicine.

THE ITCH

Of all of the diseases that attack mankind, none is so humiliating both in its appearance and in its contempt for caste or class, and none so awkward in its results, as that commonly called the itch. No less a figure than Napoleon I suffered with this condition, and reports are current of its spread through entire armies and social organizations. As pointed out by Dr. George Pernet,[7] the itch is undoubtedly an ancient disease. Celsus certainly recognized it and recommended sulphur mixed with liquid pitch as affording relief both to man and to cattle. It is interesting to follow Pernet in his analysis of the literature of the past and to find how close certain observers were toward determining the cause of the disease and yet failed to grasp the connection between the disease and the parasite. Moreover, the history of the discovery of pediculosis parallels that of scabies in this point. In the work of Paré and a number of other writers of his period there are references to a minute animal in connection with the itch, but these authors continue to account for the eruption by disturbances of body "humours." An English naturalist, Moufet, pointed out that the animalcule was to be found in the neighborhood of the pustules, and Hauptmann supplied a drawing of *Acarus scabiei* in 1657. Cestoni, an Italian apothecary, told in 1687 how women in Italy picked the acarus out of its burrow; and Richard Mead, who traveled in Italy during that period, taught that itch was a local disease due to a parasite and required local treatment. As is usual with medical knowledge, however, its dissemination occurred irregularly; whereas Dr. Samuel Johnson's dictionary, dated 1755, defined itch as "a cutaneous disease extremely contagious, which overspreads the body with small pustules filled with thin serum, and raised, as microscopes have discovered, by a small animal," medical writers as late as 1819 declined to accept the causal relationship. Pernet's historical investigation casts an interesting light on this disease, and affords important data for the psychologist interested in the thought processes of scientific investigation.

6. White, W. A.: Presidential Address, Am. J. Psych. **5**:1 (July) 1925.

7. Pernet, George: Historical Notes on Scabies, with Remarks on Palaeontology of the Acarus, Brit. J. Dermat. & Syph. **37**:312 (July) 1925.

THE SYNTHESIS OF CHOLESTEROL IN THE BODY

Owing to the fact that it can be prepared in crystalline form, and hence presumably in a state of comparative purity, with great ease from a variety of body sources, cholesterol is early brought to the direct attention of the student of medicine. He can separate it in abundance, without skilled technic, from the brain and other nervous structures. It is readily isolated from gallstones, and thus impresses itself on the observer as having occasional pathogenic significance. Cholesterol occurs both free and as esters in the circulating blood. In fact, the compound is so widely distributed in the animal economy that it has been looked on as a never failing component of animal cells in general. Strange as it may seem to those who are impatient at the slow progress of scientific discovery, the real function of this ubiquitous higher alcohol remains to be determined. It is scarcely to be assumed that any seemingly omnipresent tissue component is devoid of some biologic use. Of late, new interest has been infused into considerations of cholesterol through the discovery that it may become "activated" by irradiation with ultraviolet rays so that it acquires antirachitic potency. Physiologists have long been curious to know whether cholesterol can be synthesized de novo in the body or whether it is one of those substances, like the vitamins, that must be supplied "ready made" with the diet. It might be supposed that an answer to the query could easily be secured by feeding experiments in growing animals subjected to a cholesterol-free diet. The difficulty heretofore has been that no regimen had been devised that was free from cholesterol and yet adequate for growth. The conventional sources of the indispensable fat-soluble vitamins all contain cholesterol, though it is well established that the latter as such does not function as a vitamin. Success in devising a sufficient cholesterol-free diet has recently been achieved, however, by Channon [1] at the Institute of Physiology, University College, London. Not only did growth on it proceed satisfactorily, but increment in size was attended with a proportionate increase in cholesterol in the body, so that the content of this substance was apparently well within normal ranges. The organism would thus seem capable of synthesizing cholesterol.

1. Channon, H. J.: Cholesterol Synthesis in the Animal Body, Biochem. J. **19**: 424, 1925.

Value of Personality.—The most valuable asset of the physician is personality. Its influence in sickness is mental healing, and it is of greatest value when trained and directed. The methods of employing such healing are infinite, for they vary with age and sex, with race and religion, and with circumstances.—Robertson, G. M.: *Lancet* **2**:214 (Aug. 1) 1925.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—Dr. Frederick F. Russell, director of the International Health Board of the Rockefeller Foundation, New York, and Dr. Leslie L. Lumsden, U. S. Public Health Service, addressed the sixth annual conference of county health officers at Montgomery, September 8.

Changes at Andalusia.—Dr. Charles N. Leach, New York, who has been in charge of the bureau of epidemiology of the state department of health, has been placed in charge of the International Health Board Training Base for public health officers at Andalusia. Dr. Wilson G. Smillie, who has been in charge of the training base for about three years, has been transferred by the International Health Board to a post in New York.

ARIZONA

Dr. Krause Lectures.—Dr. Allen K. Krause, Baltimore, editor of the *American Review of Tuberculosis*, delivered three lectures on the pathology of tuberculosis before the Pima County Medical Society, Tucson, the last week in September, and addressed audiences at the University of Arizona and at the high school assembly hall. Dr. and Mrs. Krause also attended a number of social functions arranged by local physicians and their wives.

CALIFORNIA

Infantile Paralysis Epidemic.—The California State Board of Health reports that there were 581 cases of infantile paralysis in the state up to August 31, this year, as compared with 49 cases in the same period last year. There were 20 deaths in June and 35 in July. There were 205 cases reported in July and 200 in August.

Chirothesian Found Not Guilty.—M. T. Larkin, Los Angeles, who was arrested on a charge of practicing medicine without a license, was found not guilty after a three day jury trial. Albert Carter, special agent for the state board of medical examiners, cites this case as an exemple of the handicap of prosecuting cases with inexperienced prosecutors. The evidence showed that Larkin treated paralysis, tumors, rheumatism and kidney disease. Larkin contended he had the right to do such things in accordance with the tenets of the Chirothesian Church, of which he is a member.

CONNECTICUT

Health Exhibit at Fairs.—The state department of health reports that thousands of people have attended the health exhibits conducted by the state department of health at the county fairs throughout the state, and that they have all been given health leaflets published by the health department. The exhibit represented the activities of the whole department of health.

FLORIDA

Charged with Attempting to Bribe.—Governor Martin has issued an order, it is reported, directing Dr. William J. Buck, Jacksonville, president of the state board of medical examiners, to show cause why he should not be removed from office on a charge of soliciting a bribe of $1,000 for issuing a license to practice medicine.

Hospital News.—The Victoria Hospital property at Miami has been sold and plans have been made to improve the property by enlarging the hospital to 106 beds and the erection of a $700,000 hotel for convalescents who desire to be under medical care without entering a hospital.——Plant City recently authorized a bond issue for a $50,000 hospital building.

Personal.—Dr. John F. Bresnahan has been appointed superintendent of the Jackson Memorial Hospital, Miami. Dr. Bresnahan is a graduate of the University of Pennsylvania School of Medicine and in hospital administration at the Massachusetts General Hospital, also of the Field Medical School of the Army in which he served as major during the war.——Dr. Mark B. Herlong, health commissioner of Jacksonville, sailed for France, September 15, to represent Jacksonville at the International Congress of Cities. Dr. Herlong will then tour the continent to observe municipal activities.——Dr. Ernest C. Levy, formerly of Richmond, Va., assumed his duties as city health officer of Tampa, September 14.

IDAHO

Hospital News.—The Nazarene Sanatorium, Nampa, will conduct a campaign for funds for a new building in October. ——The hospital at Boise now being used by the Veterans' Bureau is being remodeled at a cost of about $20,000. At present there are 114 patients in the hospital.

State Medical Election.—At the annual meeting of the Idaho State Medical Association, Pocatello, September 3-5, Dr. Nathaniel R. Wallentine, Sandpoint, was elected president; Dr. Duncan L. Alexander, Twin Falls, vice president, and Dr. Joseph N. Davis, Kimberly, secretary-treasurer.

ILLINOIS

Hospital News.—The health department of Springfield has arranged to establish a municipal contagious disease hospital, which will be constructed and operated as a unit of St. John's Hospital.

New Tuberculosis Sanatorium.—With the construction of the new Madison County Tuberculosis Sanatorium nearing completion, the sanatorium board is looking about for a superintendent and general manager for the institution, a man thoroughly conversant with tuberculosis, able to manage an institution of 100 beds, a farm of 53 acres and the personnel that will be attached to the institution.

Society News.—Dr. Walter F. Seymour, for thirty-two years a medical missionary, addressed the Galesburg Medical Society at a dinner, September 15, on "The Problems and Pleasures of a Physician in China."——Dr. Evarts A. Graham, professor of surgery, Washington University School of Medicine, St. Louis, addressed the Madison County Medical Society at St. Anthony's Infirmary, Alton, October 2, on "The Treatment of Pulmonary Conditions by Surgical Means."

Mosquito Control Work.—The twelve most southern counties in Illinois are considered by the state department of health as the "malaria belt." While they represent only about 5 per cent. of the population of the state, they have about 60 per cent. of the total malaria. There was last year eighty deaths from malaria in Illinois; about forty-eight deaths, therefore, occurred in the twelve southern counties. There are three species of mosquitoes in certain regions of Illinois which transmit malaria: *Anopheles quadrimaculatus, Anopheles crucians* and *Anopheles punctipennis.* Mosquito control work was started by the state department of health in 1922 at Carbondale, and at present there are more than twelve cities conducting mosquito campaigns. The activities of communities in mosquito control this year has been greater than in all previous years. Communities engaged in mosquito campaigns of various kinds include Carbondale, Murphysboro, Belleville, West Frankfort, Gorham, Ravinia Park, Winnetka, Kenilworth, Glencoe, Evanston and Highland Park. The Chicago Sanitary District, the North Shore Sanitary District and several Cook County organizations cooperate in antimosquito work.

Chicago

Society News.—The regular meeting of the Chicago Society of Industrial Medicine and Surgery will be held at the Great Northern Hotel, October 5, at 8:30. Dr. Emile C. DuVal will speak on "Diathermy in the Treatment of Industrial Cases."

Another Swindler.—Information has been received that a man giving the name of Russell Palefano has called on physicians in Chicago presenting himself as a patient with venereal disease, paying for treatment by means of a large check and asking for the difference in cash. His check has turned out to be worthless.

Hospital News.—Dr. Frank Billings will lay the cornerstone of the Albert Billings Memorial Hospital at the University of Chicago, October 3, and Max Mason, Ph.D., president of the university, will preside at the ceremonies; Dr. Henry A. Christian, professor of medicine, Harvard University School of Medicine, Boston, will deliver an address.——The four-story building on Cambridge Avenue, formerly used by

the Grant Hospital for a nurses' home, has been sold and will be remodeled for hotel purposes.

Anniversary of Chicago Surgical Society.—At the twenty-fifth anniversary dinner of the Chicago Surgical Society, October 2, Hotel Sherman, the speakers were charter members of the society. Dr. Edward Wyllys Andrews' subject was "Albert J. Ochsner—Our Colleague and Friend"; Dr. Weller Van Hook spoke on "The Advance in Surgery in Chicago During the Last Twenty-Five Years"; Dr. Lewis L. McArthur, "The Surgical Profession in Chicago in the Last Twenty-Five Years," and Dr. Arthur Dean Bevan, "The Teaching of Surgery in Chicago in the Last Twenty-Five Years." Among former eminent surgeons of Chicago who were charter members were Drs. Senn, Fenger, Murphy, Ochsner and John E. Owens.

KANSAS

Infantile Paralysis.—Three cases of infantile paralysis were reported near Cunningham, September 14.

Personal.—Dr. Arthur D. Gray has been appointed in charge of the new urologic clinic which was opened by the city health department at the city hall, Topeka, September 16.

Medical School Exhibit at Fair.—University of Kansas School of Medicine, Rosedale, arranged a display of 150 pathologic specimens from the school's museum for exhibition at the Free Fair at Topeka. A staff of attendants from the medical school, comprising Drs. Harry R. Wahl, dean, and Ferdinand C. Helwig of the faculty and others, were in charge of the exhibit. Among the specimens were tuberculosis of the lung, kidney disease, gallstones, heart disease and microscopic studies of cancer.

KENTUCKY

Personal.—Dr. Hervey B. Scott has been reappointed a member of the department of neurology and psychiatry at the City Hospital, Louisville.——Dr. Martin J. Sauter has been appointed a member of the board of health of Newport to succeed Dr. George Brown.——Dr. William A. Krieger, Newport, has been appointed health commissioner of that city, to succeed Dr. John Todd, resigned, who has been health officer for the last sixteen years. Dr. Todd's resignation becomes effective November 1.—— Dr. Edward P. Guerrant, Winchester, has been appointed physician to the Kentucky Wesleyan College.

Smallpox Survey.—The state board of health investigated the reports of smallpox in ninety-five of the 120 counties in the state and found that there had been 1,700 cases in the fiscal year ending June 30, 1925, of which 150 were severe and eight fatal. The survey showed also that about 30 per cent. of the school children of the state had been successfully vaccinated against smallpox, the number of vaccinated ranging from 1 per cent. of the school children in some counties to about 100 per cent. in others. The code of health of Kentucky contains definite regulations which require vaccination as a prerequisite to attendance at school. The state board, September 11, therefore declared an emergency to exist and called on county and city boards of health and boards of education to enforce the vaccination laws as to the eligibility of unvaccinated children to attend school.

LOUISIANA

Appointments to Board of Health.—At the meeting of the council of Alexandria, September 8, a resolution was adopted providing for the appointment of a city board of health, and the following members were appointed: Drs. Joseph A. Packer, Leonard D. Gremillion, G. M. Graham Stafford, Mayor J. F. Foisy and Irvin McGinis.

Society News.—Dr. William F. Bay, U. S. Veterans' Bureau Hospital No. 27, addressed the Eighth District Medical Society, Pineville, September 15, on "Principles of Rest in the Treatment of Tuberculosis," and Dr. George L. Drouin, Mansura, a member of the state house of representatives, spoke on action taken by the last legislature of interest to the medical profession.

Personal.—Dr. Joseph O. Weilbaecher, New Orleans, has been appointed physician to the police department, to succeed Dr. Leonard C. Chamberlain.——Dr. Victor C. Smith has been appointed head of the department of ophthalmology at the new Southern Baptist Hospital, New Orleans.——H. W. Conner, Richmond, Va., has been appointed full-time sanitary inspector for St. James Parish.——Dr. Allen B. Jemison, Macon, Ga., newly appointed director of the health unit of DeSoto Parish, arrived in New Orleans, September 25, to assist the state department of health in maternity and infancy work for one month.——Dr. E. Aitken Segar, of the Imperial College, Port of Spain, Trinidad, is in Louisiana observing public health methods.

Record Enrolment at Tulane.—Tulane University of Louisiana School of Medicine, New Orleans, opened its annual session with the largest freshman class in years. The pressure for admission into the medical school was such, it is reported President Dinwiddie said, that several hundred students were refused admission. The following seventeen new members have been added to the faculty of the undergraduate school of medicine: James O. Foley, Ph.D., instructor in anatomy; Drs. John D. Humber, instructor in anatomy; Edmond L. Faust, instructor in clinical obstetrics; Arthur Caire, instructor in clinical obstetrics; Curtis H. Tyrone, instructor in clinical obstetrics; Emmett L. Irwin, instructor in clinical surgery; Rodger J. B. Hibbard, instructor in pathology and bacteriology; Stuart A. Wallace, instructor in pathology and bacteriology; Shirley Carlton Lyons, assistant in anatomy; Earl Z. Browne, assistant in medicine and in the laboratories of clinical medicine; Russell C. Pigford, assistant in medicine and in the laboratories of clinical medicine; Louis V. J. Lopez, assistant in clinical psychiatry; Euclid B. Gill, assistant in pediatrics; George L. Hardin, assistant in clinical ophthalmology; Frank L. Loria, assistant in clinical surgery; James L. Smith, assistant in pathology and bacteriology; Stella M. A. Leche, B.Sc., student assistant in biochemistry.

MARYLAND

Society News.—At the regular meeting of the Baltimore County Medical Association, September 16, at the Medical and Chirurgical Faculty Building, Baltimore, Dr. Edward A. Looper gave an illustrated lecture on "The Diagnosis and Treatment of Tuberculosis of the Larynx."

Dr. Halstead's Work to Be Published.—An edition of the complete works of Dr. William S. Halstead, late professor of surgery at Johns Hopkins, is under way, edited by Dr. Walter C. Burket, Evanston, Ill., in two volumes. As an introduction to the edition, a biographic sketch of Dr. Halstead is being written by Dr. William H. Welch, director, Johns Hopkins School of Public Health and Hygiene, who is the oldest living associate of Dr. Halstead. Dr. Halstead was associated with Johns Hopkins University from 1881 until his death, September, 1922.

Expansion of Johns Hopkins Hospital.—According to statements issued by the Johns Hopkins Half Century Committee, development extending over ten years and involving an expenditure of $13,000,000 is planned for the Johns Hopkins Hospital. The plan calls for additional endowment of the hospital and school for nurses, building and endowment of new medical and surgical clinics, an institute for the study and treatment of diseases of the nervous system, a convalescent branch of the hospital, a central medical library and a special endowment to aid persons of moderate means. The quarters of the medical and surgical wards have remained essentially the same since 1889, when the hospital was opened. A part of the quarters used by the nurses has been assigned to the Wilmer Institute; even prior to this change, many nurses had to live outside the hospital. Special work in nervous diseases is needed to supplement the work of the Henry Phipps Psychiatric Clinic. The Half Century Committee hopes to obtain in October from Baltimore $1,500,000 for the support of the university and the hospital. The most pressing need of the hospital is endowment for work for the sick children of Baltimore. Since almost all of the children cared for are from Baltimore, the hospital must depend primarily on Baltimore to support this work.

MASSACHUSETTS

Lectures on Mental Health of Children.—The Boston University School of Education announces a series of fifteen practical lectures on "Understanding the Child and His Needs," to be given on Tuesday evenings at 8 o'clock at 688 Boylston Street, Boston, beginning September 29. The course will be given in cooperation with the Massachusetts Society for Mental Hygiene and discussions will follow each lecture. Credit of one point will be given toward the degree of bachelor of science in education or the degree of master of education. In the second semester a course of lectures will be given on the "Physical Life of the Child."

MICHIGAN

Police and Fire Surgeons.—The annual meeting of the National Association of Police and Fire Surgeons will be held in Grand Rapids, October 6-7. City physician, Allison H. Edwards, is chairman of the local committee on arrangements. A subject which will receive attention at this meeting is the proposal to standardize the physical requirements of civil service employes, especially of policemen and firemen in large cities. Proposed standards will be submitted to this convention for definite action. There are about 150 members in this association which is now four years old. Previous conventions have been held in Philadelphia, Atlantic City and New York.

Society News.—Dr. William F. Wild, field director of the American Society for the Control of Cancer, addressed a public meeting under the auspices of the Wayne County Medical Society, Detroit, September 15, on cancer.——Dr. Hugh Cabot, dean and professor of surgery, University of Michigan Medical School, Ann Arbor, will address the Wayne County Medical Society, October 5, on "Diagnosis and Methods of Attack on Tumors of the Kidney."——Henry F. Vaughan, D.P.H., Detroit, city commissioner of health, addressed the East Side Physicians' Association, October 1, at the Whittier Hotel on "The Relationship of the Board of Health to the General Practitioner."

Heart Disease in Michigan.—The August *Bulletin* of the state department of health says that heart disease was the cause of 13.1 per cent. of all deaths in Michigan in 1924, a rate of 159.2 deaths per hundred thousand of population. A comparison of the rates for heart disease in Michigan and in the U. S. registration area as a whole for eight years ending with 1922 shows that the Michigan rate was continuously higher than that of the registration area. About 60 per cent. of the deaths from organic heart disease occur after the age of 65; the last census showed that 5.3 per cent. of the people of Michigan were at least 65 years of age, whereas in 1870 only 2.7 per cent. of the people had reached that age. The health department points out that in the last half century the population of the state has changed so that it has twice as many candidates for heart disease as formerly, and that the relatively slight increase in the rate is, therefore, no cause for apprehension.

New Whooping Cough Regulations.—The department of health of Detroit notes in its bulletin that there were seventy deaths from whooping cough in that city this year up to September 1 as compared with forty-six deaths in the same period last year. New regulations have therefore been adopted to control the whooping cough situation, one of which is that whooping cough clinics will be discontinued by the department of health; physicians of the health department will not send whooping cough patients to the department clinic for diagnosis and treatment but refer them whenever possible to private physicians or to the city physician. The isolation period for whooping cough is considered as four weeks from the date of the report of the disease. The patient and susceptible contacts during the period of isolation shall be confined to the premises which include the home and rear yard only, but susceptible contacts (these are considered children of preschool and grade school age who have not previously had whooping cough) may be transferred to the home of adult friends for observation during the period of isolation.

MISSISSIPPI

Personal.—Dr. John D. Spelman, medical superintendent of the Touro Infirmary, New Orleans, recently surveyed the Natchez Hospital, Natchez, for the purpose of making recommendations regarding standardization.——Dr. Charles P. Coogle has been elected officer in charge of the Leflore County health unit.

MISSOURI

Infantile Paralysis.—Since March 1 there had been reported forty-four cases of infantile paralysis in Kansas City and fourteen deaths. However, in the two weeks ending September 21 only one new case had been reported.

Society News.—Dr. Joseph P. Costello addressed the St. Louis Medical Society, September 22, on "Roentgen Ray of the Thymus in Infantile Eczema," and Dr. Willard Bartlett on "What Course to Pursue When Confronted by a Goiter Patient with a Second Surgical Lesion."——At the general meeting of the St. Louis Medical Society, September 29, Dr. Randall S. Tilles gave a lantern slide demonstration of "An Early Case of Hydatiform Mole." Dr. Joseph E. Stewart spoke on "Kohler's Disease of Tarsal Scaphoid."

Grand Jury Investigation of Diploma Mill Charges.—The Jackson County Grand Jury, sitting at Kansas City, will investigate the Missouri medical diploma mill scandal. When the grand jury convened, September 22, Judge Nelson E. Johnson gave instructions to indict persons found guilty of fraud in obtaining licenses or diplomas. The judge said, in part, "There have been many charges of late that men have received diplomas to practice medicine in this state who are not entitled to receive them, and that men have received licenses to practice medicine in this state who are not entitled to receive licenses. If these charges are true, it is hard to conceive of a greater crime, because into the hands of these men fall the woes and the ills of our citizens."

New State Board of Health.—Following his request for the resignation of all members of the state board of health, Governor Baker has appointed the following physicians members of the new board: Dr. William A. Clark, Jefferson City; Drs. James Stewart and Willard Bartlett, St. Louis; Dr. Herbert A. Breyfogle, Kansas City; Dr. Elmer T. McGaugh, Richmond; Dr. Herman S. Gove, Linn, and Dr. Homer L. Kerr, Crane. In his announcement, the governor stated that he desired Dr. William Clark to be elected president of the board and Dr. James Stewart, secretary, at the meeting of the board held in Jefferson City, September 23. Dr. Clark was formerly president of the state board of health from 1917 to 1921 and last year was president of the Missouri State Medical Association. The members of the old board who were reappointed to the new board of health are Drs. Stewart, Kerr and Gove.

MONTANA

Resolution on Medical Taxes.—At the last meeting of the Medical Association of Montana, Lewistown, resolutions were passed declaring unjust the war tax of $3 against physicians under the Harrison Narcotic Law, the tax on traveling expenses necessary for attendance at medical meetings and the tax on expense of postgraduate study.

NEW JERSEY

Chiropractor Convicted.—It is reported that John H. Conover, Jersey City, was sentenced, September 22, to three months in jail on a charge of practicing medicine without a license. This is said to be the third time that Conover has been convicted on similar charges.

NEW YORK

Sanatorium for Actors.—The National Vaudeville Artists, Inc., announced, September 23, the purchase of a 50-acre estate near Saranac Lake to be used as a sanatorium for patients which are supported by that organization. The buildings will be remodeled, it is reported, to make the institution available to all branches of the theatrical profession.

Society News.—The Westchester County Medical Society held its September meeting at the Grasslands Hospital, White Plains, and in addition to an inspection of this 500-bed hospital were addressed by Dr. Robert W. Gover, New York, on "Infantile Paralysis," followed by a report by Dr. Leo J. Schweiger of the resident staff, on eleven cases of this disease recently treated in this hospital.

Nurses Dismissed.—The forty-seventh graduate nurse was dismissed from duty at the Albany Hospital, Albany, September 13, it is reported, for conduct considered in violation of hospital regulations. The board of governors announced new rules for nursing, August 8, which specified in part that nurses should not have a choice of day or night duty, of the class of patient, or whether they should care for one or more patients and the rate of pay was fixed in accordance with the number of patients cared for. The dismissals, it is reported, arose out of opposition to these rules.

Hospital Experiment with Mental Cases.—The report of the Winifred Masterson Burke Relief Foundation for 1923-1925 details work done in treating selected psychoneurotic patients by introducing them into the general group of patients at the convalescent home and in the general régime at the Burke Foundation. A report on the progress of about 500 cases will be forthcoming. The foundation maintains a convalescent home at White Plains and other branch homes. The report

shows, says the New York *Times*, that in all 49,154 patients have been treated at the White Plains institution since it opened in 1915.

New York City

Personal.—Dr. Martin L. Janes has been appointed visiting hematologist to the Manhattan State Hospital, Wards Island. ——Dr. Royal S. Copeland has been elected president of the newly organized Fordham National Bank at Jerome Avenue and Fordham Road.

Dr. Basil Graves to Lecture.—The New York University and Bellevue Hospital Medical College announces that beginning October 5, Dr. Basil Graves, London, England, will give three courses of two weeks each in slit lamp microscopy of the eye at that college. Further information can be obtained from the secretary, 338 East Twenty-Sixth Street.

Trust Funds of Academy of Medicine.—The annual report of the New York Academy of Medicine for 1924, which has just been received, shows that the trust funds of the academy amount to $761,268.97. The number of separate funds specified is twenty-five, ranging in amount from $100 up to the "general permanent fund" (the income of which is to be used for advancing medical science) of $412,680.71. During 1924 six other organizations maintained offices in the academy buildings, the Medical Society of the State of New York, the Medical Society of the County of New York, the Society for Relief of Widows and Orphans of Medical Men, the Physicians' Mutual Aid Association, the Hospital Information Bureau, and the Committee on Dispensary Development; thirty-eight organizations held their meetings in the academy buildings, and accommodations free of charge were granted to other associations, committees and lectures.

NORTH CAROLINA

Personal.—Governor MacLean announces the appointment of Dr. William A. Rogers, Franklin, as a member of the board of trustees of the State School for Deaf at Raleigh. ——Dr. Verne S. Caviness, Raleigh, has announced his retirement from the Mary Elizabeth Hospital staff and Diagnostic Clinic.

District Society to Conduct Clinics.—The annual session of the Tenth District Medical Society was held at Canton, September 23, under the presidency of Dr. Louis G. Beall, Black Mountain. Dr. William de B. MacNider, president, North Carolina Medical Society, the guest of honor, spoke on "The Value of Certain Drugs in Hypertension." Dr. Francis M. Davis was elected president and Dr. John LeBruce Ward, Asheville, secretary. It was decided to conduct a clinic in each of the smaller cities of the district during the year.

Tuberculosis Conference at Oteen.—A conference called by the U. S. Veterans' Bureau will be in session for two weeks at Oteen, beginning September 23; among the lecturers in attendance are Drs. Roy D. Adams, Washington, D. C.; Henry Kennon Dunham, Cincinnati; John D. MacRae, Asheville, N. C.; Nathan Barlow, dean, U. S. Veterans' Postgraduate School for Tuberculosis; Lieut.-Col. Earl H. Bruns, M. C., U. S. A., and Dr. Edgar O. Crossman, Washington, D. C. More than eighty physicians of the Veterans' Bureau are attending.

Society News.—The Edgecombe County Medical Society held a joint open session with the Parent-Teachers' Association in Greenville, N. C., September 9, and were addressed by Dr. Charles O'H. Laughinghouse of the state board of health on public and private health interests of school children. ——The Wake County Medical Society recently endorsed the proposal of the Wake County Board of Health to launch an infancy and maternity hygiene ward in order to secure a standard training for midwives with proper professional instruction.

OHIO

Society News.—Dr. William J. Mayo, Rochester, Minn., was the guest of honor, September 18, at the Medical Education Day held by the Academy of Medicine of Cleveland for physicians of the fifth district of the state association.

Personal.—Dr. I. C. Riggin, Richmond, Va., recently state epidemiologist of Virginia, assumed the duties of county health commissioner of Lorain County, October 1, succeeding Dr. William A. McIntosh, who will go to Siam for the International Health Board.

Sandusky Typhoid a Milk Epidemic.—It is reported that the state director of health, Dr. J. E. Munger, recently returned from an investigation of the typhoid epidemic at Sandusky, where he found that sixty cases had been reported, all of which had been using milk from the same dairy. The dairy owner was directed to pasteurize his milk supply and prevented from delivering milk until that had been done.

PENNSYLVANIA

Typhoid at York.—About twenty cases of typhoid fever were recently reported in or near the city of York; eight new cases were reported, September 12.

Memorial Opened.—The new Lewes Mason Memorial Building of the Chester County Hospital, was opened to inspection by the public, September 19. The building is the gift of Pierre Du Pont of Wilmington and Longwood, and is dedicated to the memory of Lewes Mason, a ward of Mr. Du Pont, who died during the pandemic of influenza.

Charities Association Meeting.—The Public Charities Association of Pennsylvania will hold the fall meeting of the board of directors in Bethlehem, October 23. There will be a luncheon at the Hotel Bethlehem under the joint auspices of the Central Council of Social Service and the Woman's Club of Bethlehem. Dr. Charles H. Frazier, Philadelphia, will be the toastmaster and Dr. William L. Estes, Bethlehem, a director of the association, will preside.

Personal.—Dr. Joseph C. Bloodgood, Johns Hopkins University Medical School, Baltimore, addressed the Lycoming County Medical Society, Williamsport, September 14, on "The Diagnosis of Breast and Bone Tumors."——Dr. Harvey R. Bauman, Hawley, and his wife, Dr. Ella G. Bauman, formerly of Allentown, will sail, October 3, for India, to take up work as medical missionaries.

Joint Meeting at Valley Forge.—Physicians from the medical societies of Chester, Delaware, Schuylkill and Berks counties held a joint meeting at Valley Forge recently at the invitation of the Chester County Medical Society. Dr. William T. Sharpless, West Chester, councilor of the Third District, presided, and among the speakers were Dr. Wilmer Krusen, health commissioner of Philadelphia; Dr. Ira G. Shoemaker, president-elect of the Medical Society of the State of Pennsylvania, and Dr. John Norman Henry, president of the state society. Following the meeting a luncheon was served at the Valley Forge Inn.

Philadelphia

Hospital News.—Mayor Kendrick turned the first sod in starting the construction of the new $4,000,000 Philadelphia General Hospital at Thirty-Fourth and Pine streets, September 22.

Society News.—At the first fall meeting of the Women's Auxiliary of the Philadelphia County Medical Society, in the Bellevue-Stratford Hotel, September 17, Dr. Charles N. Sturtevant, Frankford, spoke on "The Care of Children."

National Medical Congress at Sesquicentennial.—The Philadelphia County Medical Society is making plans for a National Medical Congress in this city next year during the sesquicentennial celebration. Invitations will be sent to national and international medical organizations to meet in Philadelphia simultaneously. An international medical congress was held in Philadelphia in 1876 during the celebration of the centennial.

Dr. French Goes to University of Pennsylvania.—Dr. Harley E. French has been appointed assistant professor of anatomy in the University of Pennsylvania School of Medicine, according to the announcement made by Josiah Penniman, LL.D., president and provost, at the opening exercises, September 25. Dr. French was professor of anatomy and dean of the School of Medicine of the University of North Dakota for fourteen years and professor of physiology and anatomy at the University of South Dakota for four years.

Opening Session at Jefferson Medical College.—The one hundred and first annual session of Jefferson Medical College, Philadelphia, was opened, September 23, with an assembly of the faculty, officers of the college and the student body in the new hospital building. The freshman class, which, it is reported, numbers this year 175, was selected from more than 2,200 applications for admission. William Potter, president of the board of trustees, and formerly U. S. minister to Italy, Dr. Ross V. Patterson, and Dr. Fielding O. Lewis, professor of laryngology, gave addresses. Additions to the faculty announced were Dr. Pascal Brooke Bland, professor

of obstetrics, Dr. William M. Sweet, professor of ophthalmology, and Dr. Edward A. Strecker, professor of nervous and mental diseases.

TENNESSEE

Personal.—Dr. Haven Emerson, New York, spent September 14-16 in Memphis for conferences in connection with the survey of hospitals and other health agencies in this city.

Hospital News.—The Mountain View General Hospital, Erwin, was recently opened.——The new building of the King's Mountain Memorial Hospital, Bristol, will be opened, October 7.

Medical Arts Building.—The Tennessee Independent Order of Odd Fellows will erect a twelve-story medical arts building costing $800,000, at 119 Seventh Avenue, North, Nashville. There will be a garage in the basement for tenants in the building which will accommodate ninety cars. Work on the structure will start as soon as the old building on this site can be removed.

TEXAS

Hospital News.—Dr. A. B. Garland has awarded the contract for a $50,000 hospital building at Cumberland and Wichita streets, Vernon, which will bring the total bed capacity of the hospital to 125.

Personal.—Dr. Charles W. Castner, September 1, assumed the duties of superintendent of the State Hospital for the Insane at Wichita Falls.——Meyer Bodansky, Ph.D., associate professor of biological chemistry, University of Texas Department of Medicine, Galveston, has been granted a leave of absence for 1925-1926 to accept a temporary appointment in the department of chemistry of Stanford University.

Proposed Health Unit for Amarillo.—The Potter County Medical Society has appointed a committee, comprising Drs. James R. Wrather, Willis H. Flamm and Martin L. Fuller, to investigate a report on the proposal of the Rockefeller Foundation to establish a health unit in Amarillo. The financial arrangement will be that the state health department, the city of Amarillo, Potter County and the Rockefeller Foundation pay appropriate portions of the expense of the unit.

Enforcing the Medical Practice Act.—The secretary of the State Medical Association of Texas writes that the association is joining heartily in the campaign of the state board of medical examiners to enforce the Medical Practice Act, and that they are being successful. The chief offenders against the Medical Practice Act in Texas, the secretary says, are chiropractors. The Medical Practice Act now has a clause providing for injunction against chronic violators of this law, which is being applied as soon as possible in each case. Prosecutions are now pending in a large number of counties in the state and complaints are being filed almost daily.

WASHINGTON

Society News.—Dr. Carl E. Koenig addressed the Puget Sound Academy of Ophthalmology and Otolaryngology, September 15, at the Virginia Mason Hospital, Seattle, on "The Value of the Granger Line in Diagnosis of Disease of the Sphenoid Sinus."——The general meeting of the King County Medical Society, September 14, was held in conjunction with the Surgical Section. A motion was carried for the appointment of a committee to work in cooperation with the commissioner of health of Seattle in matters that pertained to the health of the city. Dr. Erestus T. Hanley, commissionor of health of Seattle, addressed the society.

PHILIPPINE ISLANDS

Outbreak of Cholera in Manila.—There were nineteen cases of cholera in Manila reported between September 1 and September 27; fourteen of them were fatal. There were also in this period forty-two other suspected cases of cholera. The health department administered anticholera vaccine, September 27, it is reported, to 4,000 persons. A later report gives the number of new cases on September 29 as twenty and the number of deaths on that day as six.

CANADA

Gifts to Hospital.—Mr. A. R. McNichol, Winnipeg, has donated $250,000 to the Winnipeg General Hospital, and $100,000 to the Children's Hospital, for endowment purposes to be used in such manner as the board may see fit.

Physicians in Provincial Parliament.—Four of twelve medical candidates for the provincial parliament of Nova Scotia were successful at the recent elections. They are Drs. Wallace N. Rehfuss, Bridgewater; John A. MacDonald, St. Peters; John L. MacIsaac, Antigonish, and Benjamin A. LeBlanc, Arichat.

Hospital News.—The Ste. Agathe Sanatorium, Quebec, was ready for the reception of patients, September 1; the capacity now is 210 beds. The old main building will be set aside for private patients; there are no wards of more than eight beds. The hospital has been taken over from the provincial government by the Laurentian Sanatorium Association.

No Medical Graduates This Year from Queens University.—As a result of changing from five to a six year course, there were no graduates in medicine from the Medical Faculty of Queens University, Kingston, Ont., for the year 1925. One hundred and seventeen students received the degree of M.B. from the University of Toronto Faculty of Medicine in June. There were twenty-one graduates from the University of Western Ontario Medical School, London.

Scholarship Prizes and Fellowships.—At the June commencement of the University of Toronto Faculty of Medicine, Toronto, J. H. Couch was awarded the George Brown Memorial Fellowship; C. E. Knowlton, the George Armstrong Peters Scholarship; William A. Costain, the Reeve Prize; C. E. Knowlton, the Chappell Prize; C. H. Best, the J. J. Mackenzie Prize; Miss C. H. Craw, the James H. Richardson Fellowship, and C. H. Best, the Ellen Mickle Fellowship.

Personal.—Dr. Arthur C. Jost, provincial health officer of Nova Scotia, has been appointed deputy registrar general.——Dr. Joseph Guerard, Quebec, has been appointed medical director of the Laval Hospital, St. Foy, Quebec, to succeed Dr. Odilon Leclerc.——Dr. James W. Crane, London, Ontario, has been elected president of the Harvey Club to succeed Dr. Hibbert W. Hill, who resigned when he accepted the position of professor of public health at the University of British Columbia.——Dr. F. May Whittaker, London, England, has arrived in Winnipeg to assume the duties of superintendent of Grace Hospital of the Salvation Army. Dr. Whittaker served four and a half years in France during the World War.

Banting Research Foundation.—The endowment of the Banting Research Foundation will be invested under the direction of the board of governors of the University of Toronto, who will act as trustees. They will pay to the governing body of the foundation the annual income from the endowment for disbursement. The present board of the foundation consists of Sir Robert Falconer, Lieut.-Col. R. W. Leonard, Dr. William E. Gallie, Prof. J. G. Fitzgerald, Prof. V. E. Henderson, Rev. Canon H. J. Cody, O. S. Macdonald and John W. Rogers. The *Canadian Medical Association Journal* says that the income from $500,000 is considered sufficient to support the foundation for some years; it is proposed to make the funds available to assist research workers either working independently or in any other university in Canada. The foundation has been established with a view to discovering means for the prevention and cure of diseases which at present are considered incurable. Neither Dr. Banting nor Dr. Best will receive anything from the foundation; they have renounced all rights to any income from royalties or patents from the sale of insulin.

GENERAL

Medical Bookplates.—Mr. H. M. Barlow, secretary of the Royal College of Physicians, Pall Mall East, S.W.1, London, England, is making a collection of bookplates of medical interest for the library of the college. Physicians who possess bookplates will aid the collection by sending copies to Mr. Barlow.

Dr. Howard Rescued.—Dr. Harvey J. Howard, head of the ophthalmologic department, Peking Union Medical College, Peking, China, who was captured by bandits, July 20, in Manchuria, and has since been held for ransom, has been released, it is reported, following a battle between his captors and Chinese troops.

Award of Prize of Roentgen Ray Society.—At the annual meeting of the American Roentgen Ray Society, Washington, D. C., September 22, the committee decided to award the $1,000 Leonard Prize in two portions of $600 and $400, and to award the former to Drs. Evarts A. Graham, Glover H. Copher and Warren H. Cole, all of St. Louis, for their work

on cholecystography (THE JOURNAL, Jan. 3, 1925, p. 14, and April 18, 1925, p. 1174) and the latter portion to G. Failla, New York, for his work on radon.

American Student Health Association.—The next meeting of this association will be in New York City, December 29-30. The meeting has been arranged to coincide with that of the National Collegiate Athletic Association at the Hotel Astor, and the program of the first session so as to interest directors of athletics and coaches. There will be four sessions in all. In arranging the program, the secretary, Dr. Warren E. Forsythe, University of Michigan, Ann Arbor, requests that those who know of interesting work in this field communicate with him.

Public Health in Palestine.—The president of the American Branch of the Palestine Foundation announced, September 26, that American Jews would be called on to contribute $3,000,000 in the next year for the development of the Jewish homeland in Palestine, and that during the four years of its existence the fund has expended there over $8,000,000, of which two-thirds has come from the United States. Among the items in its budget for the coming year is one of $200,000 for public health work to continue the campaign against malaria and other diseases.

Personal.—Dr. Theobald Smith, director of the department of animal pathology of the Rockefeller Institute, has been nominated president of the International Anti-Tuberculosis Union. At the recent meeting in Geneva it was decided to hold the next international conference at Washington, D. C., from September 30 to October 2, 1926.——Vernon Kellogg, Sc.D., of the National Research Council, was made Commander of the Order of Leopold by King Albert while in Belgium recently where he attended the meeting of the International Research Council at Brussels.

Schools Teaching Oral Hygiene.—The Department of the Interior reports that ten educational institutions now give courses for training oral hygienists, and that twenty-one states license the oral hygienists to practice while other states permit their teaching oral hygiene. The course in most cases extends over one academic year and consists in acquiring the technic of the examination and cleaning of teeth and other minor dental operations. The Department of the Interior considers this a new occupation which has arisen out of the recent development in preventive medicine.

American Stomatological Association.—For the first time in the history of the International Stomatological Association, the American Stomatological Association was admitted to membership at the recent Paris meeting. The international association, which now has twenty-eight countries represented, is a medical association which fosters the idea that the medical degree, or as it is called in some other countries the medical requirement, should be legally established for the practice of dentistry throughout the world. Alfred J. Asgis, D.D.S., New York, was appointed adjunct secretary general of the American Association, and a corresponding member of the Italian Stomatological Federation.

League Adopts Plan to Replace Opium Crop.—The League of Nations Assembly Commission adopted, September 23, the project of sending a commission to Persia to study the possibility of replacing the cultivation of opium in that country by other agricultural products and recommended to the Budget Commission the allotment of 200,000 francs for this work. This plan was sponsored last year by the American delegation to the opium conference. An investigating committee will probably start for Persia in the spring, and there is a possibility that the commission may go to Turkey for similar studies; Serbia has expressed a willingness to discuss the possibility of changing her crops also.

Classification of Dental Colleges.—According to the *Atlantic Medical Journal*, the Dental Educational Council of America has established a predental year for 1926 as one requirement for Class A rating of dental colleges. The "two-three graduate plan of dental education" now under trial proposes two years of work in a liberal arts college followed by three years in a dental school for a degree for the general practitioner while the various dental specialties can be taught in full year graduate courses to those who elect them. The Dental Educational Council recently issued a list of dental schools of the United States: there were twenty-four in Class A, fourteen in Class B, two in Class C, and the rating of three was postponed.

Building Code for Hospitals.—A committee, representing organizations of architects, engineers, insurance companies and others interested in safety, has drawn up a building code to safeguard the lives of patients and other occupants of hospitals, sanatoriums and corrective institutions. The code awaits the acceptance of all of the interested organizations when, according to *Hospital Progress*, it will be recommended for minimum use in the development of legislation concerning the construction and management of hospitals. The code emphasizes substantial construction, fire prevention and good management. The committee recommends that existing hospital buildings should be made to conform to the standards for new buildings as far as possible.

Proposed Registration Area for Morbidity Reports.—The last Congress ratified an international treaty providing that each signatory power shall publish statistics of communicable and preventable diseases. According to Surgeon General Cummings reports of communicable diseases at present are provided by state and local health officers with very little share in the expense by the federal government. Congress failed to approve an estimate of $4,000 to assist in this work for the fiscal year 1925 and a like estimate for the year 1926. At the last conference of state health officers, a resolution was unanimously adopted asking that steps be taken to create a registration area for morbidity reports comparable to the registration areas of the census bureau for births and deaths.

Automobile Fatalities.—The Department of Commerce announces that reports from thirty-nine cities of 100,000 population or more show more automobile fatalities in the four weeks ending September 12 than in the previous four weeks. In fifty-seven cities aggregating a population of 27,000,000 there were 3,313 automobile fatalities reported from January 1 to September 12, and of these 13 per cent. were reported in the last four week period. Norfolk reported no fatalities for the last eight weeks, and Albany, Cambridge, Dallas, El Paso, Fall River, Fort Worth and Somerville none for the last four weeks. Somerville, with four deaths, holds the record thus far for 1925. New York has reported to the Department of Commerce 638 automobile fatalities; Chicago, 410; Philadelphia, 191; Detroit, 183, and Cleveland and Los Angeles, 154.

Library Association Protests High Cost of German Publications.—The executive committee of the American Medical Library Association is making an investigation of the present high cost of German medical publications. It is hoped to determine whether or not concerted action on the part of medical libraries of America will cause German publishers to curtail their output and to reduce the cost of their publications to American purchasers. It is pointed out that many American libraries and publishers have donated subscriptions to German libraries and physicians, but that German publishers have seemed to appreciate but little this evidence of good will. In order to obtain evidence of the interest in some joint action in the matter, those willing to aid in the movement are asked to communicate with Miss Margaret Brinton, librarian, Mayo Clinic, Rochester, Minn.

New England Surgical Society.—The annual meeting of this society will be at Springfield, Mass., October 2-3, at the Hotel Kimball, under the presidency of Dr. John W. Keefe, Providence, R. I. There will be clinics at the Springfield Hospital Friday and at the Mercy Hospital Saturday. Among the speakers will be Dr. Charles L. Scudder, Boston; Dr. Ernest L. Hunt, Worcester, Mass.; Dr. Daniel C. Patterson, Bridgeport, Conn.; Dr. Horace P. Stevens, Cambridge; Phileman E. Truesdale, Fall River; Dr. George A. Moore, Brookton, Mass.; Dr. Carl M. Robinson, Portland, Maine; Dr. Dudley Carleton, Springfield, Mass.; Dr. Walter C. Seelye, Worcester, Mass.; Dr. William F. Verdi, New Haven, Conn., and Dr. Alfred M. Rowley, Hartford, Conn. The annual dinner will be at the Longmeadow Country Club, 7:30 p. m., Friday. The ladies are invited to a tea at the Springfield Country Club, at 4 p. m., Friday.

Bequests and Donations.—The following bequests and donations have been announced recently:

St. Joseph's Mercy Hospital, Webster City, Ia., $30,000, by the will of the late C. J. Pitcher.

Mrs. Anna Cook, Collinsville, Ill., has donated a site for a hospital for that city, provided construction is started previous to her death.

The New York Skin and Cancer Hospital, New York City; St. Christopher's Hospital for Babies, Brooklyn; the Brooklyn and Jewish Hospitals, Brooklyn, and the Graham Home for Old Ladies, Brooklyn, each $5,000 by the will of the late William D. Hoxie.

The Pennsylvania Hospital, Philadelphia, $40,000; the Philadelphia Orthopedic Hospital, $8,000; the Visiting Nurse Society, $3,000; The Pennsylvania Hospital, Philadelphia, for the use of the social service department, $2,000; the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases, $1,000; the Babies' Hospital and the Oncologic Hospital for Cancer, each $500; by the will of the late Mary F. Small.

The Presbyterian Hospital, New York, sufficient funds to endow a bed in memory of her parents and to endow a room, by the will of the late Mrs. Anna A. Johnston.

St. Joseph's Hospital, Yonkers, N. Y., $200 by the will of the late Agnes L. O'Rourke of Yonkers.

Mount Sinai Hospital, New York, $100,000 by the will of the late Mrs. Emma Rosenwald.

The Montefiore Hospital, New York, $30,000, and Mount Sinai Hospital, New York, $10,000, by the will of the late Mrs. Ida R. Cullman.

Graham Hospital, Canton, Ill., $50,000 by the will of Joseph Murphy.

St. Vincent's, St. John's, St. Alexis, and St. Ann's hospitals, all of Cleveland, $200 each in the will of the late Francis J. Frawley.

American Roentgen Ray Society Election.—About 450 physicians attended the twenty-sixth annual convention of the American Roentgen Ray Society, at Washington, D. C., September 22-25. Following installation of the president, Dr. Thomas A. Groover, Washington (who is also president of the Medical Society of the District of Columbia), by Dr. George W. Holmes, Boston, the retiring president, there was a symposium on gallbladder disease. A dental clinic was held by Arthur B. Crane, D.D.S., Washington, and L. M. Christie, D.D.S., Washington, to demonstrate the need for closer cooperation between the medical and dental professions. The Caldwell lecture, an annual feature, in memory of Eugene Caldwell, New York, a martyr to the roentgen ray, was delivered by Dr. James Ewing, professor of pathology at Cornell University Medical College, New York, who spoke on "Tissue Reactions to Radiation." The election of officers for 1926 on the last day of the convention made Dr. Russel D. Carman, Mayo Clinic, Rochester, Minn., president-elect; Drs. Patrick F. Butler, Boston, and Charles M. Richards, San Jose, Calif., vice presidents; Dr. Charles L. Martin, Dallas, Texas, secretary; Dr. William A. Evans, Detroit, treasurer, and Dr. William M. Doughty, Cincinnati, member of the executive committee. The next annual meeting will be held in the spring of 1926 at Detroit, Mich.

FOREIGN

Conference on Congenital Syphilis.—The French League Against the Venereal Peril has organized a conference for the first week in October at Paris to discuss congenital syphilis, its preventive treatment and the treatment of infants and children with manifestations of congenital syphilis.

University Chair of Physical Culture.—Our exchanges state that H. Altrock, a leader in the movement for physical training and athletics in Germany, has been called to the newly founded chair of Pädagogik der Leibesübungen at Leipzig, the first professorship of physical culture in the country.

Reception to Visiting Spanish Physicians.—The medical societies of Berlin, Germany, united in a reception to the thirty-six Spanish physicians now touring Germany. Professor Ferrán, a member of the party, announced that he would donate material to those who would like to study the results of his research on the mutation of tubercle bacilli and vaccination against tuberculosis.

Centennial of Medical School.—In the second week of November will be celebrated the centenary of the Regia Escola de Cirurgia at Lisbon. A souvenir volume is to be published with the history of the school, and the bust of the late Prof. M. Bombarda will be unveiled, and a memorial tablet to the physicians who died in clinical service. A souvenir medal is also planned and a retrospective exposition, and series of postgraduate lectures throughout the month. The students are also organizing athletic events. Profs. Ricardo Jorge, Bello Moraes and Egas Moniz are to deliver the main addresses.

Personal.—The Minich prize, awarded by the Venice Academy of Sciences, has been divided between Prof. L. Castaldi, Florence, and Prof. P. Enriques, Padua, for their works, "Influence of the Suprarenal Cortex on the Growth of the Skeleton" and "Functional Relations Between the Endocrine Glands and Fracture of Bones." The topic appointed for competition was "Influence of the Endocrine System on the Skeleton."——Dr. Vogel-Eysern, Davos, is the secretary of the newly organized International Bioclimatic Federation. ——The Graefe prize awarded by the German Ophthalmologic Society was not given entirely to Prof. E. Seidel, Heidelberg, as announced at first, but was divided equally between him and Prof. von Szily, Münster. The prize winning research of the former was on the interchange of fluids in the eye, and glaucoma; of the other, on embryology and teratology of the eye.——Dr. Pio Naldi, who was condemned to seventeen years' imprisonment for the killing of Count Bonmartini, has had part of his term condoned and has been rehabilitated by the Turin court of appeals. He has settled at Benevento.

Government Services

U. S. Public Health Service

Surg. Charles Armstrong has been directed to proceed to such places as may be necessary up to September 30, and return, to investigate complications associated with vaccinations against smallpox.——Acting Asst. Surg. Albert S. Gray has been directed to proceed from time in time up to September 30 on receipt of written instructions, to Barre, Vt., and return, in connection with the physical examinations made in the marble quarries at Barre.——P. A. Surg. Claude W. Mitchell has been directed to proceed to Baltimore, and return, for a conference relative to studies of diphtheria conducted in that city.——Surg. Gleason C. Lake was directed to proceed, August 1, to Norton, Va., and such other places as necessary to investigate an outbreak of tularemia.——Senior Surg. Taliaferro Clark was directed to proceed about July 31 to Hagerstown, Md., to inspect the progress of child hygiene studies being conducted at that place.——Dr. John F. G. Gates has been appointed assistant surgeon in the regular corps of the U. S. Public Health Service.——Acting Asst. Surg. William W. Hoyt has been relieved from duty at Marseilles, France, and assigned to duty at Glasgow, Scotland.——Surg. J. G. Townsend has been directed to proceed from Washington, D. C., to Baltimore and return, in connection with influenza investigations. ——Asst. Surg. Kenneth F. Maxcy has been directed to proceed from Montgomery, Ala., to Savannah, Ga., and return, in connection with studies of Brill's disease.——Surg. James P. Leake has been directed to proceed from Washington, D. C., to Cincinnati and other points in that vicinity, and return, in connection with tetra-ethyl lead gasoline studies. ——P. A. Surg. J. F. Mahoney has been relieved from duty at Ellis Island, New York, and assigned to duty at Dublin, Ireland, and will be detailed temporarily to Cobh and Belfast to meet emergencies in the examination of aliens.——Acting Asst. Surg. Neil E. Taylor has been directed to proceed from Cincinnati to Hartford, Conn., and other places in that vicinity as may be necessary, and return, in connection with goiter study.

Army Personals

Capt. Virgil A. Harl, M. C., U. S. Army, has resigned, effective October 30.——Major James A. Bethea, Washington, D. C., will sail about Jan. 6, 1926, from New York to the Philippine Islands for duty.

Three Hundred Changes in Veterans' Bureau

Efforts are being made by the director of the Veterans' Bureau to place the medical personnel of the bureau on a more stable basis. Director Hines recently conferred with President Coolidge to obtain approval of a plan to create a medical corps in the bureau similar to that of the army and the navy. General Hines explained that the efficiency of the medical officers would be advanced. He said that at present there are more than 1,700 medical officers in the Veterans' Bureau, and that there were more than 300 changes in the personnel in the last year, which in itself is proof that action should be taken to place Veterans' Bureau physicians on a more stable footing. General Hines told the President that the proposed medical corps would not add more than $100,000 to the annual expense of the Veterans' Bureau.

Special Instruction for Navy Officers

The Bureau of Medicine and Surgery, Navy Department, announces that it is ready to receive applications from officers who wish to specialize. The next course in aviation medicine at the Army School, Mitchell Field, Long Island, N. Y., will begin in January, 1926; those who desire to qualify as flight surgeons should make application before December 1. The bureau desires to call the attention of medical officers to the need and importance of laboratory work, and applications for special instruction in this field are assured of receiving favorable consideration. A number of medical officers, fully qualified, who desire fellowships in surgery, should submit their applications not later than July 1, 1926.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 12, 1925.

Protest by Irish Physicians Against the Government Proposal to Establish a Separate Medical Register

The proposal to establish in Ireland a medical register separate from that of Great Britain has produced an intense controversy in which the government of the Irish Free State is on one side and practically the whole Irish profession, including the ordinary nationalist supporters of the government, are on the other. It is a question of nationalism—always a powerful force in Ireland—versus the interests of the medical profession. A meeting of several hundred physicians from all parts of the Free State was held in the Royal College of Surgeons, Dublin, to protest against the proposal of the Free State government to establish a separate register. Mr. R. C. B. Maunsell, President of the Royal College of Surgeons, Ireland, who presided, said that the agitation had not been undertaken in the interests of physicians now practicing, as the proposed change would not affect their well-being, but was solely in the interests of future generations of physicians, and through them of the public. Leaders of the profession had no political motive, nor did they wish to embarrass the government; but when the executive council had declared its intention to advise a change which would almost certainly bring ruin on the Irish School of Medicine and Surgery, it was incumbent on those whose duty it was to guard and cherish that school to point out the disastrous consequences of proposed legislation. The Dublin surgeon Sir Arthur Chance said he had the opinion of an authority, which he unhesitatingly bowed to, that on the expiration of the present arrangement in February, 1926, two things would follow automatically. First, the Irish branch of the medical council would consist wholly of Ulster members and control would be transferred to Belfast; second, the medical act of 1886, with all sections relating to colonial and foreign lists and reciprocal recognition of colonial diplomas and physicians, would cease to apply to the Free State. The machinery for reciprocity would be destroyed by the Free State's own action. The only way of restoring power to the Free State to apply for real reciprocity would be for the South Irish and the British parliaments to pass acts, simultaneously. If a separate register was set up in the Free State, the medical council would be like a bull with a ring in its nose and would have to go when and where the rope led it. The impotence of the Free State medical council would not enhance the dignity of the Free State, while there was not a colony or dominion today in the British empire which would not leap at the advantages the Free State government proposed to forego. A second resolution was passed, that, should the conference not come to a satisfactory conclusion, a public meeting be held at an early date to enable the governors and subscribers of hospitals to discuss the effect of the proposed change. Surg. John S. M'Ardle said that Irish hospitals would lose the services of a large number of students who now gave services freely to those institutions. Sir Thomas Myles said that the public hardly realized how much the efficiency of Dublin hospitals depended on the services rendered freely by the students. On the other hand Mr. Cosgrave, president of the Free State executive council, has made a momentous statement to a deputation of the president and fellows of the Royal College of Physicians of Ireland. He said that a final and definite decision had been made to promote a bill in parliament for the establishment of a medical council and register for the Free State. He hoped that the Irish physicians would cooperate with the government in the framing of the necessary legislation. When the bill had been passed, his government would approach the British government with a view to obtaining some form of reciprocity between the countries. He believed that he would obtain such a measure of reciprocity as would safeguard the status of those seeking Irish medical qualifications. The deputation urged that, in the meantime, the existing conditions be allowed to continue. Mr. Cosgrave was sympathetic with this request, but insisted that any such conditions must not be used to delay the settlement of the Irish register. He said that if the medical profession was willing to cooperate with him he would be willing to meet them, but if they should refuse cooperation the government was prepared to go to the country and fight the matter out on the hustings.

Fear by Irish Veterinary Surgeons of a Separate Register

The proposal for the institution of a separate medical register for the Free State, it is feared, will be followed by a similar proposal in respect to veterinary surgeons, who at present form part of the corporate body of the Royal College of Veterinary Surgeons, with headquarters in London. The divorcement from this body and the investment of sole control within the borders of so small a country as the Free State may prove disastrous to the Veterinary College of Ireland, located in Dublin, as it will contract the field for appointments which graduates of the college, the only one in Ireland, have hitherto enjoyed. Since the opening of the college in 1900, up to the end of 1924 there have been 411 graduates, of whom 212, or 51.58 per cent., are practicing in the Irish Free State. The remainder (48.42 per cent.) are either located in northern Ireland (14.35 per cent.) or outside Ireland (33.1 per cent.) in British government service of the army or colonies, or practicing in Great Britain. The fear of separation appears already to have caused a diminution of entrants, for only five students presented themselves for examination at the end of the first year's professional course in July last.

Two Types of Tsetse Fly

In a letter to the *Times*, Dr. G. D. Hale Carpenter, senior medical officer in charge of trypanosomiasis, Uganda, calls attention to confusion arising from looseness of expression in discussions of the tsetse fly problem. He points out that there are two tsetse flies: (*a*) those inhabiting bush of greater or less density not necessarily near water, and (*b*) those requiring thicker forest and proximity to water. The first-named group contains *Glossina morsitans, G. pallidipes*, and the recently discovered *G. swynnertoni*. The former species was known as "the fly" to the South African pioneers, and pallidipes was the first species proved by Sir David Bruce to be the carrier of "fly disease" of cattle; together with *Glossina morsitans* it is the most fruitful cause of this. Subsequently, however, the allied human disease, trypanosomiasis, devastated Uganda, and when it was proved to be carried by *Glossina palpalis*, which typically inhabits thick forest near the water, attention was naturally directed rather toward the species directly inimical to man than to those only indirectly harming him through his cattle. After the subsidence of the great epidemic in Uganda, attention was again directed to *Glossina morsitans* on account of an acute human disease carried by it and not causing the symptoms typical of trypanosomiasis. More recently, *Glossina swynnertoni* has been shown to carry this disease. Thus, at the end of the nineteenth century the term "the tsetse" would have been generally interpreted to mean *Glossina morsitans;* but when the great epidemic was raging in Uganda at the beginning of this century, the term would probably have connoted in

the public mind the water-frequenting *Glossina palpalis*. But the pendulum has now swung back again to accentuate the importance of the *Glossina morsitans* group, partly on account of the great attention paid to it by the recent parliamentary commission to East Africa. Extermination of the tsetse fly is at present much discussed, but it is necessary to specify which tsetse fly. The species of the first group can be attacked by systematic burning of the bush on a large scale in the dry season. How can this be done so as to affect *Glossina palpalis* living near the water, where the vegetation is always green and usually of very dense type? Sufficient clearing to destroy the fly is quite beyond the powers of the limited population inhabiting infested areas, and the utmost that seems possible from purely administrative measures is the concentration of the population withiu areas of size no larger than can be made safe by the united efforts of the inhabitants.

Increase of Railway Accidents

More people were killed and injured in accidents to trains, rolling stock and permanent way on British railways during 1924 than in any year since 1920. According to the ministry of transport, returns of accidents and casualties on the railways of Great Britain for the year ended Dec. 31, 1924, 42 persons were killed in 1924 and 683 injured, as compared with 19 and 566 in 1923, 21 and 519 in 1922, and 30 and 678 in 1921. In accidents caused by the movement of railway vehicles, exclusive of accidents to the trains themselves, 366 people were killed and 6,538 injured, 2,677 of the latter number being passengers and 3,764 employees of the company. In accidents on railway premises not connected with the movement of railway vehicles, 54 people were killed and 18,420 injured. The totals for the year under review show that 462 people were killed and 25,641 injured, as compared with the following number for the previous four years: 1923, 407 and 23,104; 1922, 402 and 19,344; 1921, 416 and 18,873; and 1920, 635 and 25,143. There were 290 train collisions in 1924, 408 derailments, 331 cases of trains running into level crossing gates, 98 fires, and 24 miscellaneous accidents to trains. Of accidents to, or failure of, rolling stock, the most frequent were failures of coupling apparatus, to the number of 10,586. Sixty-two cases of derailment of passenger trains occurred, and in 140 cases trains ran into animals on the line.

French and English Birth Rates

It is a current misconception that the stationary population of France (a diminishing one but for immigration) is due to the low birth rate. But the French birth rate approximates closely the English one, although in England there is a steady increase of population. The explanation is that what is wrong with France is the infant mortality. The French birth rate for 1923 was 19.4 per thousand of population, while that of England and Wales was 19.7. The rate for the latter in the first quarter of 1925 was equivalent only to an annual rate of 19.4. On the other hand, the death rate of France in 1923 was 17 per thousand, as compared with 11.6 in England and Wales. Deaths of infants under 1 year of age in the same period were 96 per thousand births, as compared with 69 in England and Wales.

Air Pollution in the City of London

Dr. Howarth, health officer for the city of London, refers to the evil from coal smoke. During July, 1924, the amount of deposit registered as falling in the city was 53 tons. Of that mass, 24.9 tons was soluble and 28.7 tons insoluble, and consisting of tar, carbon, and grit. For many years it has been increasingly obvious that the use of electricity and gas for heating and cooking is contributing to the diminution of the nuisance from smoke. The cost of electricity is still far too great for its general use, but the substitution of gas for coal and coke in restaurants and business premises is practicable.

Diphtheria in London

Reference to the increasing prevalence of diphtheria in London is made in the annual report for the year 1924-1925 of the Metropolitan Asylums Board. There is a popular tendency, it says, to class diphtheria with scarlet fever, typhoid and certain other infectious diseases, as one that modern medical science has definitely controlled. That, however, is far from being the case, and London especially should look for an advance comparable with the introduction of the antitoxin treatment thirty years ago. The board's figures show that the attack on diphtheria has fallen behind that directed against the other infectious diseases. This disease, which is now the most destructive of the infectious diseases encountered in Great Britain, and, at any rate in London, appears to be resisting attack. It is suggested that education authorities should follow the lead of New York and undertake the testing and immunization by the Schick method of all children of school age.

PARIS

(From Our Regular Correspondent)

Sept. 9, 1925.

Clinical Types of Pulmonary Gangrene

At the recent congress of medicine in Nancy, Drs. Bezançon and De Jong presented an excellent paper on clinical types of pulmonary gangrene. They emphasized that the term "pulmonary gangrene" had become more comprehensive recently. At present the conception includes all fetid suppurations of the lung. Most commonly they are complications of bronchial dilatation; less frequently they are caused by septic pulmonary embolism, air-borne infection or tracheal deglutition of food or pus. Primary types follow general weakening or are without assignable cause. The authors distinguish three principal types: 1. An acute type (the embolic type); with genuine septicemia; signs of localization lacking or not discoverable till late. In this Rist emphasized the diagnostic significance of thoracic pain. 2. An acute type with signs of localization; genuine pneumonia, rapid spreading and cavitation. Here the onset may be sudden and the evolution rapid; in other cases the gravity of the symptoms coincides with the appearance of cavities. 3. Localized types with successive periodic attacks, which are the forms on which Bezançon and De Jong dwelt, calling attention to the polymorphism of this type and pointing out that the onset—which may take on the form of hemoptysis—may be sudden or insidious. They hold that roentgenologic signs, which are exceedingly variable, changing from day to day, cannot be relied on to differentiate these types. The same thing is true of physical signs. The successive periodic attacks are, however, of great significance in recognizing this type of pulmonary gangrene. The attacks are distributed over several years (usually three or four). They are followed by remissions during which there is a chance of recovery. Sometimes the sputum ceases to be fetid, but, as a rule, expectoration persists. Relapses generally occur and the patient gradually grows weaker. The end is often hastened by grave pleural complications, which are more frequent when the gangrenous focus is superficial. Occasionally a pain in the side and intense dyspnea point to the opening in the pleura of the gangrenous focus.

The authors considered that the bronchial type did not merit a description. They pointed out that purulent bronchitis is not associated with gangrene and that it is caused only by a collection of anaerobic organisms which are responsible for its particular character. The association of tuberculosis and pulmonary gangrene is exceptional. Usually it is only a

slight gangrene of the walls of a large cavity or a bronchus. The diagnosis of pulmonary gangrene is difficult, for all the pulmonary cavities opening into bronchi easily become the seat of fetid suppuration. The same is true of pulmonary abscess, interlobar pleurisy and dilatations of the bronchi. The chronicity of certain pulmonary gangrenes with periodic flare-ups adds to the difficulties of the clinician. Hemoptysis is a significant sign if it occurs repeatedly. If laboratory examination of the sputum reveals numerous polymorphous micro-organisms, spirochetes or fusospirillary forms, that will aid in the diagnosis. Bezançon and De Jong stressed the importance of the labors of Veillon, Zuber and Rist, who established the part played by anaerobes in gangrenous processes. In dealing with the importance of spiral organisms in pulmonary gangrene, they spoke of the association of fusospirillary forms and of the spirochete occurring in Castellani's hemorrhagic bronchitis (bronchospirochetosis).

In discussion, M. Rist gave his point of view, emphasizing the types of gangrene that develop after aseptic surgical operations, gastrostomy, gastro-enterostomy and the radical treatment of epigastric hernia. He recommended artificial pneumothorax as early treatment possibly combined with serotherapy and arsenotherapy. M. Jaquerod supported the opinion of the authors that pulmonary tuberculosis and pulmonary gangrene were but rarely associated.

ITALY

(From Our Regular Correspondent)

Sept. 9, 1925.

Regulations for the Protection of Mothers and Infants

Signor Federzoni, minister of the interior, has appointed a commission to draw up a preliminary set of regulations for the protection and assistance of mothers and infants. The commission consists of Professor Marchiafava, chairman; Prof. Ernesto Pestalozza, Dr. Alberto Pironti, Signor Martire and Professor Valagussa.

The Fourteenth Italian Congress of Stomatology

The fourteenth Italian Stomatologic Congress, which is under the auspices of the Federazione stomatologica italiana, will be held at Fiume, September 10. This congress is important from both the scientific and the professional standpoint. Many Italian and foreign stomatologists have sent communications on various subjects. Hungarian stomatologists, chiefly, will attend. After the congress at Fiume, the Italians will inspect the Stomatologic Institute in Budapest and will be present at the unveiling of a monument in memory of the Hungarian stomatologist von Arkövy, who died recently.

The Italian-English Reciprocity Agreement as to Licensure in Medicine and Surgery

The new reciprocity agreement between Italy and Great Britain allows graduate physicians and surgeons of either nation to have their names enrolled in the medical register of the other, whereby they may practice their profession in either country without having to pass a new examination.

Prize Open to Italian Medical Officers

In connection with the ceremonies that the Italian medical corps held last year in memory of the physicians who fell during the war, Surgeon General Ferrero di Cavallerleone established a fund of 20,000 liras, stipulating that the quadrennial proceeds should be awarded to the medical officer in active service who, during the four years, had won the greatest distinction, either through the publication of an important work or treatise of a medicoscientific character or through having made some important scientific discovery. In case no such award can be made, the proceeds shall be given to the medical officer on active duty who, by virtue of his character and attainments, gives the best assurance of being able to profit by a period of study abroad in the military medical service of some other nation. By a recent royal decree, the foundation has been approved.

Typhoid and Antityphoid Vaccination in the Italian Army

In connection with an outbreak of typhoid fever that occurred in a regiment of field artillery during last year's shooting tournament, Colonel Memmo, M.D., of the ministry of war, completed studies on the epidemiology of typhoid in the Italian army. Antityphoid vaccination was first introduced into the army during the war with Libya (1912-1913) and was made compulsory in March, 1917. The aqueous vaccine prepared by either the Wright-Leishmann, the Pfeiffer-Kolle or the Vincent (ether) method was first used. With these vaccines three successive injections, at intervals of one week, were necessary. This proved inconvenient for several reasons: the immobilization of troops for a certain number of days on three separate occasions; the difficulty of getting all the men to submit to all three vaccinations, and the necessity of enduring the reaction phenomena three times. The lipovaccine proposed by Le Mignic was therefore adopted in a ministerial circular of February, 1920. By this method, only one injection is given the troops, and this soon after they enter the service, or about thirty days after the vaccination against smallpox. The adjoined table shows incidence of typhoid per thousand effectives during the last twenty-five years:

1899..... 5.4	1908..... 3.2	1917..... 2.6
1900..... 6.2	1909..... 1.3	1918..... 1.3
1901..... 5.2	1910..... 1.9	1919..... 0.2
1902..... 4.1	1911..... 4.0	1920..... 0.5
1903..... 4.1	1912..... 7.1	1921..... 2.8
1904..... 4.4	1913..... 7.1	1922..... 2.7
1905..... 5.1	1914..... 8.5	1923..... 2.5
1906..... 4.4	1915..... 17.9	1924..... 4.0
1907..... 3.1	1916..... 1.2	

These figures give rise to certain epidemiologic considerations. The war with Libya and the World War (particularly during 1914 and 1915) lowered organic resistance of the soldiers, and added to sources of infection and contagion. However, the results of antityphoid vaccination during the war with Libya were good, for the morbidity among the nonvaccinated troops was 35.3 per thousand and that of the vaccinated was 7.2 per thousand (Ferrero di Cavallerleone). Also during the recent war, vaccination and revaccination lowered the morbidity rate from 17.9 to 1.3 per thousand. These results may be attributable not solely to vaccination but in part to the hygienic measures that were instituted.

But the foregoing morbidity table reveals that during the last four years the proportion of men contracting typhoid (1921, 2.8 per thousand; 1922, 2.7; 1923, 2.5, and 1924, 4.0) has increased. Since there has been no slackening in the campaign against typhoid in the army, it is difficult to explain this increase. Professor Memmo, however, has observed a sort of decennial rhythm in the incidence of the disease during the last quarter century. The disease abated from 1900 to 1909 (from 6.2 to 1.3 per thousand), increased during the following decade, aggravated by the exigencies of war, and again abated to a morbidity rate of 0.2 per thousand in 1919. Since 1919 there has been a slow upward trend. The causes for this rhythmic movement (which may be noted in almost all infectious diseases) may be sought in several circumstances: immunity, predisposition of the organism, conditions of time and place, pathogenic action of the micro-organisms, and vehicles of the epidemic.

Cursory examination of the morbidity statistics seems to indicate that antityphoid vaccination has not exerted any

beneficent influence on this periodicity. But it will be seen that the minimum has been reached only since the introduction of antityphoid vaccination, while the maximum was the direct result of the World War.

We have not as yet exact data for comparison of morbidity among the vaccinated and nonvaccinated. The statistics of 1921 reveal that in that year there were 335 cases of typhoid among the vaccinated troops and 316 cases among the nonvaccinated. Since the number of men not vaccinated, though it does not represent the total number under arms, is certainly much greater than the number of vaccinated, among the vaccinated the morbidity should have been less and higher among the nonvaccinated, assuming that the number exposed to typhoid was approximately the same in the two classes.

BERLIN

(From Our Regular Correspondent)

Sept. 12, 1925.

Gratuitous Treatment of Colleagues

Since time immemorial German physicians have accorded gratuitous treatment to colleagues and their families. What was at first a usage has come to be regarded in many quarters as a duty, with the result that many societies have designated it as such in their by-laws. Under present economic conditions, it seems inadvisable to continue the custom. In several articles that appeared in the *Deutsche medizinische Wochenschrift*, nearly twenty years ago, Professor Schwalbe, the editor, indicated some disadvantages arising out of the custom and asserted that gratuitous treatment of colleagues should not be regarded as an unquestionable right. The disadvantages affect both the physicians and their patients. Now that the number of specialists has so increased, and they are so often called to advise general practitioners, though the opposite is seldom true, we can scarcely speak of exchange of services. Numbers of physicians accept treatment of specialists or consult authorities. With some specialists these colleagues constitute a considerable portion of their patients, so that gratuitous treatment of colleagues deprives the specialists of appreciable portions of their incomes. Gifts of wine, foodstuffs and other articles by no means make up the loss of cash fees. On the other hand, it must be painful for a practitioner or his family to accept the services of a colleague without an opportunity to pay him. In view of present economic conditions, it is pardonable that specialists and consultants, when colleagues unknown to them seek their services, do not find time for them so readily as for paying patients. For these reasons, physicians often prefer not to mention their profession when in need of treatment.

Recently Dr. Schwalbe in the *Wochenschrift* reopened the question in connection with a case which has proved the unsoundness of the principle of gratuitous treatment of colleagues. An ophthalmologist treated a physician in Rhenish Prussia for grave iritis. The specialist claimed that he had visited his colleague's residence at least twenty times and that the patient had come to his office at least 300 times. When he demanded 1,700 marks for professional services, the patient refused. In court, the plaintiff asserted that not only was the alleged number of visits and consultations erroneous and the amount demanded unjust, but also that it was the custom for physicians to treat one another gratuitously. The court asked the *Aerztekammer* (chamber of physicians) of the district whether this was customary among physicians, and also whether specialists usually treat colleagues without charge even though the case is protracted. The *Aerztekammer* answered in the affirmative, whereupon the court rejected the petition of the ophthalmologist, citing as authority the *Bürgerliche Gesetzbuch* (civil code of laws). Schwalbe demands that *Der deutsche Aerztetag* or at least the Prussian *Aerztekammernausschuss* announce that gratuitous treatment by colleagues no longer be regarded as a professional custom or duty, not only in the interests of the attending physicians but also for the benefit of the colleagues or their families in need of treatment. He refers to an utterance of *Oberreichsanwalt* Ebermayer, a collaborator of the *Wochenschrift* on subjects of jurisprudence, who advises that physicians cease to accord one another gratuitous treatment, because it is not in keeping with the present changed conditions. It should be left to the attending physician to decide, in each case, whether or not he shall require a fee.

Regulations Governing the Sale of Canned Milk

In recent years, there have been repeated alleged grievances in connection with the sale of canned milk. Analysis revealed a fat content ranging between 6.4 and 8.1 per cent. Four samples, after they had been diluted in accordance with the printed directions, yielded solutions of which the content in dry milk substance was much less than that of ordinary milk. Five samples of condensed milk of various origin yielded fat content between 7 and 14 per cent. Differences in price of the various brands corresponded in a general way to variations in fat content. The dilution recommended in printed directions on a can of condensed milk is, as a rule, the only indication to the purchaser as to the degree of evaporation of the product and is therefore a criterion of its value. The buyer expects that if he dilutes the canned product according to directions he will secure an equivalent of ordinary milk.

Samples of canned milk were purchased in different stores and it was observed that some foreign products with foreign labels were merely plain sterilized milk and in other cases condensed partially skimmed milk. Both, however, were sold under the name "condensed milk." One shop advertised condensed partially skimmed milk as "condensed milk" and sold condensed whole milk as "cream." Another shop designated condensed whole milk as "Libby's cream."

These deceptions can be combated from various angles: through the law pertaining to the sale of foodstuffs, on the basis of the penal code (*Strafgesetzbuch*), the law against unfair competition, and, in most cases, on the basis of misleading statements made on the containers of foodstuffs (act of June 26, 1916). A new draft of the law pertaining to the sale of provisions is being prepared, and it is thought that this will deal with the sale of canned milk.

Marriages

RICHARD REINOEHL GATES, Lebanon, Pa., to Miss Anna S. Groth of West Philadelphia, August 20.

LEO EDWARD STENGER, Logan, Ohio, to Miss Hazel Jeanette Smith of West Jefferson, September 8.

CLARENCE LU VERNE SMITH of Iowa City to Miss Marion MacKenzie of Muscatine, Iowa, July 11.

MILTON B. GALLOWAY to Miss Ethelle Eugenia Richards, both of Webster City, Iowa, August 6.

JOHN F. VELTMAN, Holland, Mich., to Miss Esther L. Jongewaard of Ames, Iowa, recently.

RICHARD MARTIN RUTLEDGE, Peoria, Ill., to Miss Dorothy Phillips of Delavan, September 19.

DANIEL GREENLEE CALDWELL, Brooklyn, to Miss Ivey Tille Bets of Chester, Pa., June 6.

HAROLD LEON GOLDBURGH to Miss Hortense Pearlman, both of Philadelphia, August 2.

MAXWELL H. THURM to Miss Dorothy Raphael, both of Brooklyn, September 6.

RICHARD M. BRICKNER to Miss Ruth Helen Pilpel, both of Brooklyn, July 1.

Deaths

Eugene Robert Kelley ✠ Commissioner of Public Health of Massachusetts, committed suicide at his home in Boston, September 27, aged 42. Dr. Kelley graduated from Johns Hopkins University Medical Department, Baltimore, in 1906; from 1909 to 1911, he was assistant commissioner of health of the state of Washington and commissioner of health from 1911 to 1915. He was then appointed director of the division of communicable diseases of the Massachusetts State Health Department, and in 1918 was appointed commissioner. Dr. Kelley was secretary of the Conference of State and Provincial Health Authorities of North America, from 1916-1919; president of the conference, 1921-1922, and president of the Massachusetts Conference on Social Work, 1923-1924.

John Wheelock Elliot, Boston; Medical School of Harvard University, Boston, 1878; member of the Massachusetts Medical Society and the American Surgical Association; clinical instructor of gynecology, 1888-1889, and lecturer on surgery, 1900-1905, at his alma mater; formerly on the staff of the Free Hospital for Women, Brookline, and the Massachusetts General Hospital; aged 72; died, September 17, at his home in Needham, Mass.

Earl Warren Presley ✠ Staten Island, N. Y.; University and Bellevue Hospital Medical College, New York, 1912; president and formerly secretary of the Richmond County Medical Society; served in the M. C., U. S. Army, during the World War; on the staffs of the Richmond Memorial, Seaside and Seaview hospitals; aged 36; died, September 15, at the Staten Island Hospital, following an operation for stricture of the intestine.

Thomas McC. Lippitt ✠ Lieutenant (j. g.), U. S. Navy, retired, Berryville, Va.; University College of Medicine, Richmond, 1897; entered the navy as an assistant surgeon, July, 1898, and was retired from active service September 25, 1902, as a result of injuries received during the Boxer rebellion in China in 1900; aged 52; died suddenly, September 16, of heart disease.

Thomas Jefferson Stout ✠ Brinkley, Ark.; University of Nashville (Tenn.) Medical Department, 1901; past president and secretary of the Monroe County Medical Society; proprietor of a hospital bearing his name; at one time secretary of the Arkansas State Board of Medical Examiners; aged 52; died, August 30, of a bullet wound, presumably self-inflicted.

James M. Inge ✠ Denton, Texas; Louisville (Ky.) Medical College, 1874; past president of the State Medical Association of Texas; formerly lecturer on regional anatomy at Baylor University College of Medicine, Dallas; aged 73; died, September 9, at a sanatorium in Dallas, of septicemia.

Milton Henry Edens ✠ Anadarko, Okla.; University of Georgia Medical Department, Augusta, 1902; served in the M. C., U. S. Army, during the World War; aged 52; died, September 11, at the Wesley Hospital, Oklahoma City, of uremia, following an operation for appendicitis.

Frank Beresford Crowe ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1902; for many years chief resident physician to St. Joseph's Hospital, Reading; aged 48; died, September 12, at the National Stomach Hospital, following an operation.

John Brice Cressinger ✠ Sunbury, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1896; health officer of Sunbury; formerly member of the city council; on the staff of the Mary M. Packer Hospital; aged 53; died, September 16.

Eli Butler Ives ✠ Bridgeport, Conn.; Yale University School of Medicine, New Haven, 1903; past president and secretary of the Fairfield County Medical Society; on the staff of the Bridgeport Hospital; aged 47; died in September.

Henry M. Miles ✠ Norton, Va.; Louisville (Ky.) Medical College, 1890; member of the state board of health; specialized in ophthalmology, otology, laryngology and rhinology; aged 57; was found dead in bed, September 8.

William La Fayette Mullin, Society Hill, Ala.; University of Alabama School of Medicine, Tuscaloosa, 1900; member of the Medical Association of the State of Alabama; aged 47; died, September 8, following an operation.

✠ Indicates "Fellow" of the American Medical Association.

John Nelson Sprowls ✠ Claysville, Pa.; Jefferson Medical College of Philadelphia, 1877; for thirty-three years surgeon to the Baltimore and Ohio Railway; aged 73; died, September 11, of carcinoma of the spleen.

Paolo Virdone ✠ Brooklyn; University of Naples, Italy, 1899; formerly on the staff of the Wyckoff Heights Hospital; aged 50; was drowned at sea, September 7, when he jumped overboard en route to Italy.

Katherine J. Mackay Mackenzie, Port Coquitlam, B. C., Canada; Dalhousie University Faculty of Medicine, Halifax, Nova Scotia, 1895; aged 55; died recently, at New Westminster, of septicemia.

John Richmond Pratt, Manchester, N. Y.; Jefferson Medical College of Philadelphia, 1851; member of the Medical Society of the State of New York; aged 99; died, September 13, of senility.

John Knight Bucklyn, Jr., Mystic, Conn.; New York Homeopathic Medical College and Hospital, New York, 1887; aged 60; died, September 16, of heart disease and diabetes mellitus.

Frank Herrick Newland ✠ Clifton Springs, N. Y.; Cleveland Homeopathic Medical College, 1902; county coroner; member of the board of education; aged 52; died suddenly, September 16.

Harold James Levis, Long Island City, N. Y.; University of Michigan Medical School, Ann Arbor, 1902; aged 47; died, September 11, at the Roosevelt Hospital, New York, of pneumonia.

Nathaniel L. Whipple, Nevada, Mo.; Washington University Medical School, St. Louis, 1865; member of the Missouri State Medical Association; aged 86; died, September 12, of senility.

Grover Cleveland Back, Perkins, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1916; aged 38; was killed, September 10, in an automobile accident.

Charles Ray Smith, Carthage, Ohio; Eclectic Medical College, Cincinnati, 1921; at one time on the staff of the Bethesda Hospital, Cincinnati; aged 33; died in September.

Jerry A. Replogle, Udell, Iowa; State University of Iowa College of Medicine, Iowa City, 1898; member of the Iowa State Medical Society; aged 66; died, September 18.

Jonas B. Spitler, Yukon, Okla.; College of Physicians and Surgeons, Keokuk, Iowa, 1877; aged 72; died, August 23, at El Reno, of acute cystitis and prostatitis.

Encinas C. Callison ✠ Kirksville, Mo.; Kentucky School of Medicine, Louisville, 1889; aged 59; died, September 14, at the Grim-Smith Hospital, of pneumonia.

Emanuel Stuver ✠ Fort Collins, Colo.; Medical College of Ohio, Cincinnati, 1880; on the staff of the Fort Collins Hospital; aged 69; died, September 12.

Frank E. Corrigan, Louisville, Ky.; University of Louisville School of Medicine, 1872; aged 74; died, September 16, of cerebral hemorrhage.

Roscoe Hill ✠ Pittsfield, N. H.; Bellevue Hospital Medical College, New York, 1882; aged 68; died, July 5, at Concord, of angina pectoris.

Jonathan Rider Powell, Cambridge, Mass.; University of Vermont College of Medicine, Burlington, 1888; aged 60; died, September 8.

Joseph Singer Halstead, Breckenridge, Mo.; Kentucky School of Medicine, Louisville, 1840; aged 107; died, September 13.

Erasmus McGinnis, Bismarck, Mo.; Marion-Sims College of Medicine, St. Louis, 1896; aged 54; died suddenly, September 8.

Joseph W. Edwards, Mendota, Ill.; Rush Medical College, Chicago, 1854; Civil War veteran; aged 93; died, September 8.

James Bernard Buckley, Philadelphia; Cleveland-Pulte Medical College, 1912; aged 45; died, September 10, of heart disease.

William Thomas Kendrick, Montgomery, Ala.; Atlanta Medical College, 1876; aged 70; died, September 6, at Selma.

Isaac Louis, New York; Medical School of Harvard University, Boston, 1885; aged 63; died suddenly, September 21.

John Henry Speer, Crestwood, Ky.; University of Louisville School of Medicine, 1864; aged 85; died, September 14.

George William Reid, Albion, Ill.; Physio-Medical Institute, Cincinnati, 1884; aged 65; died, September 6.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

ANACIN

The Birth and Development of a "Patent Medicine"

Anacin is a "patent medicine" marketed by the Heidbrink Company of Minneapolis. The Heidbrink concern is not primarily in the "patent medicine" business, but is listed as manufacturers of dental supplies; in fact, Dr. J. H. Heidbrink, its president, is a dentist. Some of the claims made for Anacin are:

"Quickly relieves Headache, Toothache, Earache, Colds, Flu, Grippe, Neuritis, Neuralgia, Pain, Rheumatic Pains."

"Doctors Recommend It. Prescribed Ten Years by Doctors and Dentists Everywhere."

"Morning-After Headaches: That splitting, blinding, 'morning-after' headache goes quickly after taking the safe Anacin tablets prescribed by physicians."

"No bad after-effect on the heart."

" . . . a non-habit forming compound."

More than five years ago a physician wrote, asking for information regarding the composition of Anacin. This was the first inquiry about and the first record THE JOURNAL had of the product. This was in April, 1920. In November, 1920, the Council on Pharmacy and Chemistry received a letter from the Heidbrink Company stating that the concern was considering the possibility of putting out certain medicinal preparations and desired to conform to the rules of the Council not only in the preparation and naming of the products but also in their marketing. The company requested that information be sent it that would allow it to act intelligently in the premise. The official rules of the Council were sent to the company and it was told that should further information be desired, it would be furnished. This was nearly five years ago. So far the Heidbrink Company has not submitted any product to the Council for inclusion in "New and Nonofficial Remedies."

In August, 1922, Dr. F. W. Wittich of Minneapolis sent two bottles of Anacin—one bottle marked "Anacin spoiled" and the other marked "Anacin fresh"—to the American Medical Association. The doctor stated that Anacin was a tablet made by a wholesale manufacturing concern of Cleveland for the Heidbrink Company of Minneapolis, and had the following formula:

Acetphenetidin (Phenacetin)	3 grains
Acetylsalicylic acid (Aspirin)	3 grains
Quinin sulphate	½ grain
Citrated Caffein	½ grain

Dr. Wittich explained further that Anacin, which had been on the market locally for two years, had been used extensively by him whenever the salicylates were indicated. Recently a bottle that he had purchased showed deterioration and Dr. Wittich asked for a possible explanation of such spoilage. He was told that it seemed probable that the tablets had decomposed, due to the action of citric acid (in the citrated caffein) on the acetylsalicylic acid with the formation of free acetic acid. He was told further that citrated caffein had no advantage over the alkaloid except that the citric acid renders the caffein more soluble.

It was suggested to Dr. Wittich that, in the interest of rational therapy, instead of prescribing a "patent medicine" sold under a non-descriptive name, he determine whether the effect from the nostrum might not be secured from the administration of aspirin alone, and if not, that he find out which of the other constituents affected the action of the acetylsalicylic acid. No reply was received to this letter, but soon thereafter the formula of Anacin seems to have been changed and caffein alkaloid was used instead of citrated caffein.

A physician who recently wrote to the Heidbrink Company for information regarding Anacin received a letter from J. A. Heidbrink, D.D.S., declaring that "the Anacin formula was worked out by Dr. F. W. Wittich and his associates at the University of Minnesota Medical Department, where he had a professorship." Dr. Heidbrink also enclosed some mimeographed sheets giving what he described as "Dr. Wittich's statement concerning Anacin and its ingredients." This description mentioned that the tablet contained aspirin, acetphenetidin, quinin sulphate and caffein alkaloid but gave no information regarding the proportions of these ingredients. The same is true regarding the circular in the trade package. As under the federal law the amount of acetphenetidin has to be declared, these figures are on the small vest-pocket tin in which Anacin is sold, namely: that it contains 187 grains of acetphenetidin to the ounce. As the weight of the individual tablet is not given it necessitates a careful weighing of the tablets to determine from this the amount of acetphenetidin in each tablet. The mimeographic description

Photographic facsimile (reduced) of a typical Anacin newspaper advertisement.

ascribed to Dr. Wittich contains several statements that are without scientific foundation and also references to work that has long since been shown to be fallacious.

Here then we have the spectacle of a reputable member of the medical profession developing a "patent medicine" and allowing it to be put on the market for the indiscriminate sale to, and the uncritical use of, the public.

Correspondence

PHYSICAL THERAPY ABROAD

To the Editor:—Many American physicians are still in doubt as to the value of physiotherapy; on the other hand, a growing group of physicians have permitted their enthusiasm to get the better of their more sober judgment. Various electrical agents are in evidence in most of the important clinics of Europe. Galvanization is practiced both as a diagnostic and as a therapeutic agent. Hydrotherapy and heliotherapy are much in vogue at the various spas. Diathermy and ultraviolet therapy enjoy popularity both on the continent and in England, owing to the good results obtained by these agents during the war and the period of reconstruction. Ultraviolet, especially, is accepted with a greater degree of enthusiasm, owing, no doubt, to the splendid researches of such men as Hausser of Berlin, Davos of Dorno, and Hausmann of Vienna.

In England, the University of Cambridge offers a six months' course with a diploma in both radiology and physiotherapy. The didactic part is taught by Dean Scales at Cambridge, while the practical end is given at the clinics of the St. Bartholomew's and London general hospitals by Dr. Cumberbatch. The influence of Finsen is much in evidence in England because the carbon and tungsten arc lamps are the methods of choice for ultraviolet irradiation. Leonard Hill and his associates at the National Institute for Medical Research have been important factors in advancing light therapy to a more scientific basis in England, by their many original investigations in recent years.

France still has the living inspiration of d'Arsonval, the discoverer of the high frequency currents. Physiotherapy is a popular and accepted specialty, and much opportunity for study and work can be found at the Salpêtrière and Pitié hospitals. The aged d'Arsonval is a much honored man and occupies the professorial chair of medicine in the Collège de France. Paradoxically, while some of the earliest and best investigation in ultraviolet therapy was done in France by M. Henri, it is not much in evidence as a therapeutic agent.

Vienna and Berlin are in apparent agreement as to the choice and importance of the various types of the physical agents. Hydrotherapy is extensively used, and much space is devoted in the various hospitals to the many varieties of baths. Radium emanation and extract of pine baths enjoy much favor at the Kaiser-Jubiläum Hospital in Vienna and at the Rudolph Virchow Hospital in Berlin. Mud packs, called "Fango" baths, are also popular and in great evidence. Diathermy and the galvanofaradic types of currents are in constant use. The Jubiläum Hospital averages about 260 patients a day in the department of physical therapy, and monthly courses are offered to the visiting physician.

Nagelschmidt is the outstanding physician in Berlin in physiotherapy. The word "diathermy" is of his own coinage, and all that is known of the practical action of this current can be largely attributed to his investigations. He actively practices and teaches physiotherapy at his own hospital, and one hears at his clinic a babel of tongues from visiting physicians from all corners of the earth. At the Charité Hospital, Prof. C. Adams is in charge of the extensive division of physical therapy, while at the Rudolph Virchow Hospital, Laqueur is at the head of the department—by far the largest of its kind in Berlin. Courses of a month or longer are offered to visiting and graduate physicians. Berlin, however, is an expensive place at present.

DISRAELI KOBAK, M.D., Chicago.

IVY POISONING: ITS PREVENTIVE TREATMENT

To the Editor:—In THE JOURNAL, August 8, page 456, McNair critically reviews our report on the preventive treatment of ivy poisoning. As I directed the studies which, he says, should have been "more scientifically conducted," the duty is mine to point out wherein McNair has not quite grasped the situation.

McNair is the author of a monographic treatise on *Rhus* dermatitis which covers all its phases and includes much original work; apparently he has not perceived the difference between the scope of a monograph and a report like ours, designed to be printed in a publication such as THE JOURNAL. Our communication reported our facts to the general medical practitioner, facts of which the doctor could avail himself in his approach to the problem of human welfare. Findings of more abstruse scientific interest could be pointed out only in passing. We did not pretend to exhaust all the ramifications—indeed, it is doubtful whether THE JOURNAL could spare us space for the more extensive style of publication.

With these circumstances in mind, most of McNair's objections are disposed of at once. 1. It was quite unnecessary to use "definite quantities of the poison" in our work, as McNair would have us do. We were not interested in the percentage concentration of the virus that would induce dermatitis—the leaves and bark were tools sufficient unto us, since we were interested primarily and solely in inducing a dermatitis. Indeed, leaves and bark were preferable in our attempt to approach natural conditions as closely as possible. 2. Similarly, determination of the respiration rate, hematology, etc., were all beside the point. They were not pertinent to our phase of the subject. It would have been interminable to have essayed all the chemical and physiologic appendixes of the subject. 3. "Minimal toxic doses," as McNair recommends, would have been interesting—certainly a harmless amusement. We submit, however, that they did not require determination, because our problem was not a quantitative one. In our work only two values were concerned, one before, and the other after treatment. Hence comparative values were quite sufficient of determination. Quantitative ones were unnecessary.

There are three other criticisms that are not disposed of under our foregoing plea of "not monographic." 1. We claimed, as a new finding, that local immunity was not developed by repeated attacks of ivy poisoning. In contradiction, McNair properly calls attention to facts recorded in his monograph which clearly established priority for others *for those facts as facts.* Those facts were not interpreted by McNair, however, into the generalization that we brought out: they were part of and submerged in a running discussion of the general subject of immunity. Our intent was not to attract credit to ourselves but attention to the subject of immunity as it obtains locally. 2. McNair discusses our statement that there is probably no such thing as absolute immunity against *ivy poisoning.* In doing this he does not distinguish between (1) the artificial ivy virus and (2) ivy poisoning; i. e., between an experimental substance and the natural disease with which we are concerned. Thus, he would have us "try the poison highly concentrated and purified," etc. We were not interested in the tissue reaction against concentrated virus—only against concentrations approximate to those occurring in nature.

There are other minor criticisms which are not vital to the subject and which cannot be covered short of extensive description of the premises. As it stands, while we experience a certain sense of flattery at having drawn the lightning of Jove, we also feel some disappointment that he should not have recognized the scope of our experiments before going into print.

We still feel that our experiments and communication were of more service to the general medical public as rendered than if obscured by the multiple qualifying phases and scientific experimental appendixes such as have their very proper place in the monographic form of presentation.

FRED D. WEIDMAN, M.D., Philadelphia.

OVA OBTAINED BY DUODENAL LAVAGE

To the Editor:—There has just come to my attention a letter written by Dr. R. S. Preston, Richmond, Va., published in THE JOURNAL, April 4, and requesting references on the subject of ova obtained by duodenal lavage. You replied that you were unable to find such a report in the literature.

While working on hookworm infected soldiers I found that the ova could occasionally be aspirated through the duodenal tube. These observations were published in the *Military Surgeon* **46**:507-513 (May) 1920. Perhaps I might also mention that the tube treatment of uncinariasis previously

described in THE JOURNAL, Oct. 18, 1919, p. 1181, and in the *American Journal of the Medical Sciences* (**159**:497 [April] 1920) has continued to give superior results—in the way of *complete* parasite removal—in the hands of all those who have employed it, whether in military or in civilian practice.

JOHN L. KANTOR, M.D., New York.

AMERICAN ASSOCIATION FOR MEDICO-PHYSICAL RESEARCH—A DISCLAIMER

To the Editor:—Following is a statement relative to that portion of your article on the association mentioned which relates to me: I was not aware that my name appeared on the program of the American Association for Medico-Physical Research. If this occurred, it was wholly without my consent. I did not appear before the meeting in question. For reasons entirely personal, I cannot at this time disclose the history of my early scientific studies and graduation in medicine. Accordingly I shall discontinue the use of the title. I have not attempted to practice medicine but have devoted myself to researches in electromagnetic energies and their application to the problem of human welfare.

A. J. PACINI, Chicago.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

HOLZKNECHT ROENTGEN-RAY UNIT

To the Editor:—Recently in reading an article dealing with the therapeutic uses of the roentgen ray, I came across the term "Holzknecht" as a unit of measurement of the strength of the ray. I think it is a German term. Can you inform me as to its meaning?

E. H. GISH, M.D., Philadelphia.

ANSWER.—A Holzknecht unit is a unit of roentgen-ray dosage equal to one-fifth the erythema dose. A chemically prepared pastil is exposed at half the distance from the tube to the part under treatment, and the application is continued until the pastil has changed color to correspond with 1, 2, 3, 4, or possibly 5 of the color scale. This indicates that the irradiation has amounted to a corresponding number of Holzknecht units.

TOXICITY OF PYRIDIN, BENZENE, ALCOHOL —DENATURED ALCOHOL NO. 8

To the Editor:—Please give me any information on possible chances of so-called industrial poisoning from inhalations of fumes from a still containing denatured alcohol No. 8 (100 gallons of alcohol containing 1 gallon of pyridin base and 1 gallon of benzene). The case is that of a chemical worker inhaling fumes from a leaking still. Please do not publish my name.

H. E. W., M.D., Connecticut.

ANSWER.—In plants making denatured alcohol on a large scale, there should be such adequate protective measures that the workers are not dangerously exposed to the fumes; the closed pipe systems should be employed from the standpoint both of health and of economy (lack of waste). In large plants, therefore, one would expect acute poisoning rather than chronic poisoning, as when a break occurs in the system. In plants where the liquids are permitted to volatilize to a certain extent in the air, chronic poisoning would be expected.

The toxicology of alcohol is so well known that it needs no discussion.

Pyridin (and denatured alcohol containing pyridin) has been reported to cause an eczematous condition of the skin (Industrial Health, Kober and Hayhurst, 1924, p. 509).

Benzene (benzol) is the most toxic agent in Formula 8. Acute cases of poisoning due to benzene are of such striking character that they usually attract the attention of the physician. The chronic case, however, is often completely overlooked, especially in those plants not employing a physician, until some acute exacerbation takes place (which applies particularly to plants using open processes). Benzene is a narcotic which, when swallowed and inhaled, produces vertigo, delirium and tonic convulsions followed by deep sleep. According to Dr. Alice Hamilton, symptoms caused by inhalation in animals point to a poison with a selective action on the central nervous system, as (in order of their appearance) muscular tremors, salivation, violent twitchings, exhaustion, paralysis, narcosis, respirations first quick and then slow, rapid pulse and low temperature. "In some cases of chronic poisoning in man, petechial spots, due to small hemorrhages, have been observed. These spots have been attributed to fatty degeneration of the blood vessels. It produces leukocytosis followed by leukopenia, with an occasional increased number of erythrocytes. Larger amounts may produce an aplastic anemia. It has been stated that the aplastic anemia is due to a contamination of the drug with nitrobenzene or anilin" (New and Nonofficial Remedies, 1925, p. 66). In a study of benzene on certain aspects of metabolism, F. P. Underhill and B. R. Harris of Yale (*J. Indust. Hyg.*, March, 1923, p. 499) show that benzene exerts a catabolic influence on body tissues as a whole, as manifested by a sharp rise in the elimination of both creatin and total nitrogen. In all cases the end-results were the same; that is, all rabbits showed a leukopenia of varying degree. The New York State Industrial Commission in its *Bulletin* for November, 1920, reports two cases in men employed in an atmosphere containing benzene, who developed purpura hemorrhagica. This condition has also been reported by others. In the Second Progress Report of the Subcommittee on Benzene, National Safety Council, Oct. 3, 1924 (this and the first report may be obtained from the National Safety Council, 168 North Michigan Avenue, Chicago), the committee states that the white blood cell count is the most important early diagnostic sign of benzene poisoning. Out of a group of eighty-four workers employed in processes involving more or less continuous exposure to benzene vapors, 15 per cent. showed a white blood cell count so low as to be strikingly suggestive of chronic poisoning, indicating that besides the obvious clinical cases there exists in the industry a considerable amount of mild undetected poisoning of this type. In the opinion of this committee, the symptoms of chronic benzene poisoning (excluding the blood count) are of little value; dizziness is the most frequent symptom and pallor the most usual physical finding. The committee report also discusses a proposed method to determine the concentration of benzene in the atmosphere.

For prevention, local exhaust ventilation at the point of origin of vapors appears to be a highly efficient procedure.

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CALCIUM THERAPY IN TUBERCULOSIS

To the Editor:—What value has the calcium saturation therapy of tuberculosis, if any? Please use initials only.

E. G. C., Ohio.

ANSWER.—As is stated in "Chemistry of Tuberculosis" by Wells, De Witt and Long (Williams and Wilkins Company, Baltimore, 1923), "the theory that tuberculosis is accompanied by, and perhaps dependent upon, a demineralization and especially a loss of calcium from the body, has not been supported by the best controlled investigations. There is no acceptable evidence that there is any decrease in the amount of calcium in either the blood or the tissues in tuberculosis. . . . We have no evidence that the calcium deposition in tuberculous lesions causes them to stop progressing; it is more probable that calcification *follows* the healing of human tuberculous lesions." Animal experimentation with intravenous injections of relatively large quantities of calcium chlorid solution has not been convincingly positive, and is generally negative in its result. Thus, Masini's (*Schweiz. med. Wchnschr.* **51**: 223, 1921) tuberculous rabbits given 1 c.c. of 1 per cent. calcium chlorid solution intravenously twice a week lived from seventy-five to 120 days, while the controls lived from sixty-eight to 116 days.

Though a number of clinicians endorse the use of calcium compounds as giving definite clinical benefit, the enthusiastic opinion of the few has not been corroborated by the experience of the many.

ROENTGEN-RAY STERILIZATION

To the Editor:—1. In how many per cent. of the cases is roentgen-ray sterilization of men (and of women) of permanent effect? 2. Are five erythema doses of roentgen ray, given to an individual of 19 years and directed to the scrotum, able to produce sterility? (This treatment was given for erythema of the scrotum.) 3. About how many roentgenologists who were sterile as a result of the influence of the rays became fertile again? 4. Does roentgen-ray sterilization affect the libido? 5. Is there any treatment for roentgen-ray sterilization in the male?

K. B., New Jersey.

ANSWER.—1. While there are no exact statistics available, it may be stated that in most of the cases the sterilization is only temporary. The time of recuperation depends on the intensity of the treatment and on the individual constitution.

2. The treatments cited are apt to produce sterility, though the age of the patient offers a good chance for recovering the power to produce live spermatozoa.

3. This question is answered under 1.

4. Neither roentgen-ray nor operative sterilization necessarily affects the libido.

5. There is no specific treatment for roentgen-ray sterility in the male. Absolute removal from the influence of roentgen rays and general hygienic measures are essential.

THIOFLAVINE AND ACRIFLAVINE

To the Editor:—The Epitome of Current Medical Literature (*British Medical Journal*, Aug. 15, 1925, p. 20) contains an abstract on "Chemical Substances Inhibiting Growth of the Tubercle Bacillus." The original paper of L. Karwacki and S. Biernacki appeared in the *Annales de l'Institut Pasteur*. They suggest that the most active substance of all—thioflavine—should be tested pharmacologically. It seems to me a very important research. How does thioflavine differ from acriflavine and other flavines, which we have been using during the last several years?

SAMUEL GINSBURG, M.D., Buffalo.

ANSWER.—Thioflavine is one of many yellow dyes that have been used in the arts for years. In 1888, two process patents for its manufacture were issued by the German Empire (to the Casella Company). The names of the various compounds ending in "flavine" are of commercial appelation and have no scientific generic basis, the "flavines" being yellow dyes. Acriflavine connotes a yellow derivative of acridin; thioflavine means a yellow substance containing sulphur. Other "flavines" have names coined in the same manner. Chemically, thioflavine is methyl dehydrothio-*p*-toluidine sulphonate. Acriflavine (the base) is diamino-methyl-acridinium chlorid. The two substances, therefore, are not closely related chemically, and from a chemical standpoint it would not be logical to predict the pharmacologic properties of thioflavine from the known actions of acriflavine.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 19. Sec., Dr. H. W. Loeb, 1402 South Grand Blvd., St. Louis, Mo.

ARIZONA: Phoenix, Oct. 6-7. Sec., Dr. W. O. Sweek, 404 Heard Bldg., Phoenix.

ARKANSAS: Little Rock, Nov. 10-11. Sec., Reg. Bd., Dr. J. W. Walker, Fayetteville.

CALIFORNIA: Sacramento, Oct. 19-22. Sec., Dr. Charles B. Pinkham, 906 Forum Bldg., Sacramento.

COLORADO: Denver, Oct. 6. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

CONNECTICUT: New Haven, Nov. 10. Sec., Homeo. Bd., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 13. Sec., Dr. Edgar P. Copeland, Stoneleigh Court, Washington.

FLORIDA: Tallahassee, Oct. 13-14. Sec., Dr. W. M. Rowlett, Citizens Bank Building, Tampa.

GEORGIA: Atlanta, Oct. 13-15. Sec., Dr. C. T. Nolan, Marietta.

HAWAII: Honolulu, Oct. 12-15. Sec., Dr. Guy C. Milnor, 401 Beretania St., Honolulu.

IDAHO: Boise, Oct. 6. Commissioner of Law Enforcement, Mr. F. A. Jeter, Boise.

ILLINOIS: Chicago, Oct. 6-8. Director, Mr. A. M. Shelton, Capitol Bldg., Springfield.

IOWA: Des Moines, Oct. 14-16. Dir. of Examinations and Licenses, Mr. H. W. Grefe, Des Moines.

KANSAS: Topeka, Oct. 13. Sec., Dr. Albert S. Ross, Sabetha.

MAINE: Portland, Nov. 10-11. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, Nov. 10-12. Sec., Dr. Frank M. Vaughan, 144 State House, Boston.

MICHIGAN: Lansing, Oct. 13-15. Sec., Dr. Guy L. Connor, 707 Stroh Bldg., Detroit.

MINNESOTA: Minneapolis, Oct. 6-8. Sec., Dr. Thomas S. McDavitt, Lowry Bldg., St. Paul.

MISSOURI: Kansas City, Oct. 27-30. Sec., Dr. James Stewart, Jefferson City.

MONTANA: Helena, Oct. 6. Sec., Dr. S. A. Cooney, Power Bldg., Helena.

NEVADA: Carson City, Nov. 2. Sec., Dr. Simeon L. Lee, Carson City.

NEW JERSEY: Trenton, Oct. 20-21. Sec., Dr. Alex. Macalister, Trenton Trust Bldg., Trenton.

NEW MEXICO: Santa Fe, Oct. 12-13. Sec., Dr. W. T. Joyner, Roswell.

PHILIPPINE ISLANDS: Manila, Nov. 10. Sec., Dr. Jose V. Gloria, 686 Rizal Ave., Manila.

SOUTH CAROLINA: Columbia, Nov. 10. Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

UTAH: Salt Lake City, Oct. 6. Director of Regis., Mr. J. T. Hammond, 412 State Capitol Bldg., Salt Lake City.

WEST VIRGINIA: Charleston, Oct. 13. Sec., Dr. W. T. Henshaw, Charleston.

WYOMING: Cheyenne, Oct. 5-7. Sec., Dr. G. M. Anderson, State Capitol, Cheyenne.

Iowa June Examination

Mr. H. W. Grefe, director of examinations and licensure, Iowa Board of Medical Examiners, reports the written examination held at Iowa City, June 4-6, 1925. The examination covered 8 subjects and included 100 questions. An average of 75 per cent. was required to pass. Seventy-five candidates were examined, all of whom passed. Fourteen candidates were licensed by reciprocity. One candidate was licensed by endorsement of credentials. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
University of Illinois College of Medicine	(1925)	87.1, 92.9*
State University of Iowa College of Medicine	(1925)	83.4, 83.5, 84.6, 85.1, 86, 86.5, 86.6, 86.8, 86.9, 87, 87.1, 87.4, 87.4, 87.4, 87.4, 87.5, 87.5, 88, 88, 88.1, 88.4, 88.5, 88.7, 88.9, 88.9, 89, 89, 89, 89.1, 89.1, 89.4, 89.5, 89.6, 89.6, 89.7, 89.7, 89.9, 90, 90, 90, 90, 90.1, 90.1, 90.1, 90.6, 90.6, 90.7, 90.7, 90.7, 90.7, 90.9, 91.1, 91.4, 91.4, 91.5, 91.5, 91.6, 91.7, 91.7, 91.7, 91.8, 92, 92.1, 92.1, 92.1, 92.1, 92.4, 92.6, 94.4, 94.7, 94.8, 95
Johns Hopkins University	(1920)	85.6
Washington University School of Medicine	(1925)	89.7

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
Northwestern University School of Medicine	(1923)	Illinois
University of Illinois College of Medicine	(1923)	Nebraska
Tulane University	(1919)	Louisiana
St. Louis College of Physicians and Surgeons	(1906)	Illinois
St. Louis University School of Medicine	(1925)	Missouri
Washington University School of Medicine	(1924)	Missouri
Creighton Medical College	(1913), (1924, 5)	Nebraska
University of Nebraska	(1924)	Nebraska
University of Pennsylvania School of Medicine	(1923)	Minnesota

ENDORSEMENT OF CREDENTIALS		
College	Year Grad.	Endorsement with
Rush Medical College	(1923)	N. B. M. Ex.

* This candidate has finished his medical course and will receive his M.D. degree on completion of a year's internship in a hospital.

Minnesota June Examination

Dr. Thomas McDavitt, secretary of the Minnesota Board of Medical Examiners, reports the oral, written and practical examination held at Minneapolis, June 16-18, 1925. The examination covered 15 subjects and included 80 questions. An average of 75 per cent. was required to pass. Fifty-nine candidates were examined, all of whom passed. Seven candidates were licensed by reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Georgetown University School of Medicine		(1923)	89.9
Northwestern University School of Medicine		(1925)	87.9
Rush Medical College		(1924)*	91.9
University of Illinois College of Medicine	(1924) 84.7,	(1925)	89.5
State University of Iowa College of Medicine		(1923)	86.4
University of Minnesota Medical School	(1924)† 90.9, 91, (1925) 86.9, 88.6, 88.6, 89.1 (1925)† 85.6, 86, 86.3, 86.8, 86.8, 86.9, 87, 87, 87, 87.1, 87.1, 87.2, 87.4, 87.4, 87.8, 88, 88.2, 88.3, 88.4, 88.4, 88.6, 88.7, 88.7, 88.8, 88.9, 88.9, 89, 89, 89.1, 89.2, 89.3, 89.4, 89.4, 89.8, 90, 90.2, 90.2, 90.3, 90.5, 90.6, 90.9, 91.3, 93.1		
University of Pennsylvania School of Medicine		(1920)	88.2
University of Manitoba Faculty of Medicine		(1924)	92.1, 92.4
University of Toronto Faculty of Medicine		(1921)	85.9

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College		(1915)	Illinois
University of Michigan Medical School		(1902)	N. Dakota
Hahnemann Medical College of Philadelphia		(1923)	Penna.
University of Pennsylvania		(1923)	N. Carolina
Marquette University School of Medicine		(1925)	Wisconsin
Wisconsin College of Physicians and Surgeons		(1911)	Wisconsin
University of Toronto Faculty of Medicine		(1922)	N. Dakota

* This candidate has finished his medical course and will receive his degree on completion of a year's internship in a hospital.

† These candidates haves finished their medical course and received an M.B. degree and will receive the M.D. degree on completion of a year's internship in a hospital.

Book Notices

THE MEDICAL ASPECTS OF CHEMICAL WARFARE. By Edward B. Vedder, Lieut. Colonel, M. C., U. S. Army. With a Chapter on the Naval Medical Aspects of Chemical Warfare. By Duncan C. Walton, Lieut. Commander, M. C., U. S. Navy. Cloth. Price, $6.50. Pp. 327, with illustrations. Baltimore: Williams & Wilkins Company, 1925.

The purpose of this treatise is to bring before the medical officers of the United States Army, both regulars and reserve, information which they should possess on the medical aspects of chemical warfare. The introduction presents an excellent brief for this much maligned military weapon. It explains how gas warfare has suffered from Teutonic odium because it was first used by the Germans against defenseless troops. It explains how gas warfare has suffered also from the fact that gaseous weapons are new weapons and because the lay mind is especially sensitive to the somewhat mystic character of all things chemical. This introduction also brings out clearly that the public mind has been confused to a serious degree on this subject. This is in part a reflection of the early propaganda when the weapon was new and distinctly Teutonic, and partly the result of mere exaggeration by unscientific lecturers and writers. It is hard now for the public mind to accept that American made war gases are any more humane than German made gases. The subject has been further aggravated because organized pacifists who are unqualifiedly opposed to all militarism have chosen gas warfare as the most vulnerable point of attack against the military system. This is good generalship from the standpoint of the antimilitaristic movement, but it is poor science. The question of the humanity, effectiveness or economy of gaseous weapons cannot be judged from impressionistic premises. The only way to arrive at a true appraisal of this weapon is through a careful study of the records of the World War. Fortunately, these records are available in a high degree of accuracy, thanks to the excellent reports of the Surgeon General's Office. The authors present a careful analysis of these records and show conclusively that while gas proved to be a high casualty producer in the war, the fatalities were only about one twelfth of those resulting from other wound producing agencies. The text then proceeds to a technical classification of gaseous weapons into pulmonary irritants, vesicants, lacrimators and irritant smokes. Each gaseous weapon used in the World War is placed in its proper category and thoroughly discussed as to preparation, properties and treatment. The authors then take up the subject of protection against gas weapons, discussing successively the gas mask, protective clothing and collective protection. The rather perfunctory chapter on elementary physics and a second one on elementary chemistry scarcely comport with the vivid interest the rest of the subject matter carries. The final chapter discusses the somewhat mooted question of the treatment of certain respiratory diseases by chlorin.

The book measures up to the best expectations and is markedly free from irritating typographic errors. Its appearance at this time, when the Geneva protocol, seeking to ban gas warfare, is to come before our government for confirmation, is peculiarly timely. There are many thinking persons who have given careful study to this problem who believe that the banning of gas warfare will not advance the cause of universal peace. If universal peace is ever to be realized, it will come about, as Haldane has said, "By a careful scientific study of the causes of war." It is only in this manner that any advance has been made by science against disease, and war is a disease of society. It is not scientific, therefore, to seek to outlaw war by attempting to limit its methods. It is a grave question whether it is wise for any nation to forswear the use of such an effective weapon as military gas. The potentialities of such agencies become terrific against un unprotected country. Even the most sanguine exponents of the control of methods of warfare cannot maintain that agreements not to use this or that weapon can be made universal.

Chemical preparedness rests especially in a nation's industrial development. This comes about from the close resemblance, even identity, between industrial and military chemicals. The subject cannot be effectively controlled except by attempting to allocate the production of chemicals among the agreeing nations, so as to maintain a balance of chemical power. Such a program is fraught with immeasurable difficulties.

Any student with a sincere desire to learn the correct history of gas warfare will find a splendid opportunity in Vedder's book. To the reserve medical officer, it carries an especial appeal, because it assembles material on the action and treatment of war gases not available in any other collected source.

AN INTRODUCTION TO THE MIND IN HEALTH AND DISEASE. For Students and General Practitioners Interested in Mental Work. By T. Waddelow Smith, F.R.C.S., Deputy Medical Superintendent of the City Mental Hospital. Cloth. Price, $4. Pp. 235, with 6 illustrations. New York: William Wood & Company, 1925.

The author offers this book "in the hope that it may stimulate students in studying the many excellent textbooks now written on the subject and give a prop or two to the general practitioner in forming an opinion on the many cases of psychic origin, especially vagotonia, which come under his observation in his daily round." The introductory chapters contain several excellent colored diagrams; in addition, there is a fairly good outline of the vegetative nervous system. For the rest this book seems to be a collection of Freudian definitions—everything, from a corn to the gravest form of insanity is given a Freudian interpretation. The short paragraphs descriptive of the classic types of insanity are well done, but etiologic guesses are made at random. For instance, he says, "The origin of a large number of mental disorders is found in the disturbed equilibrium of the hormones of the organism as a whole." Again, in describing the mechanism of epilepsy, he says: "In studying the epileptic constitution one sees constantly a mixture of egotistic narcism and the drive of the paranoia dominating the conduct, until the epileptic dementia sets in, also an emotional tone circulating round the home and parents, which would strongly suggest that the infantile fixature was round the parent stage, and this is strengthened if we study the four classic cases of epilepsy in great men." This high-sounding explanation, which does not explain anything, is followed by instances in the lives of Napoleon, Dostoiefsky, Mahomet, Julius Caesar, who are considered by the author as proved epileptics. Napoleon's mother was a strong, arrogant, dominating personality,

to whom he was devoted. Dostoiefsky idolized his mother and had an epileptic episode after her death when he heard her voice. Mahomet married a woman old enough to be his mother, to whom he remained true as against all the customs of the state in which he was living. And Julius Caesar is reported to have had constant incest dreams of his mother. Speaking of epilepsy, the author says: "The regression is interesting, for it seems to go back very far in the life of the individual to the stage of Magic Hallucinatory Omnipotence; of the race to probably our fish state, as the sense of smell is intensely repressed in these cases." These citations are self-condemnatory, and further comment seems unnecessary. Contrary to the author's expectation that his book may stimulate the further pursuit of similar studies, the tendency will be to confuse the reader with much unintelligible verbiage.

FORENSIC MEDICINE. A Text-Book for Students and Practitioners. by Sydney Smith, M.D., D.P.H., Principal Medico-Legal Expert, Egyptian Government Service. With an Introduction by Prof. Harvey Littlejohn, F.R.C.S., F.R.S.E., Professor of Forensic Medicine, University of Edinburgh. Cloth. Price, $6. Pp. 498, with 117 illustrations. Philadelphia: P. Blakiston's Son & Co., 1925.

Human anatomy, physiology and pathology are the same the world over. So far as this book discusses matters determinable by those sciences, the fact that the discussion is based on the author's observation in Scotland, New Zealand and Egypt does not militate against its value in the United States. On the other hand, the very fact that the book is based largely on what the author has learned by experience gives to it, and especially to the illustrations, an unusual value. But there is no international uniformity of law or of legal principles, and this book as published in the United States seems to be merely a reprint of what was written for British dominions, based on British law. The American reader, therefore, must study with caution the chapters discussing points of law, or he may be badly misled. The book's chief value is in its discussion of identity, bodily injuries of all kinds, asphyxiation in its various forms, and the medicolegal relations of sex. These, however, are all discussed only from the standpoint of the criminal law. The discussion of mental disorders from a medical standpoint hardly gives a fair idea of prevailing concepts concerning them. Freud and psychanalysis are not mentioned, either to approve or to condemn. The discussion of poisons is brief and to the point, but it may be quesioned whether the analytic portions might not as well have been omitted. The chemist who must rely for his knowledge of analytic toxicology on so brief an account of it had better not assume the responsibility incident to such work.

AN INTRODUCTION TO SEXUAL PHYSIOLOGY. For Biological, Medical, and Agricultural Students. By F. H. A. Marshall, F.R.S. Cloth. Price, $2.75 net. Pp. 167, with 72 illustrations. New York: Longmans, Green & Co., 1925.

From such subjects as zoology, botany, anatomy, histology, embryology, physiology, obstetrics and sociology Dr. Marshall has constructed a compact volume. His treatment of the mechanism of reproduction begins with the ameba and ends with man. In discussing internal secretions of the reproductive organs, he touches on the rejuvenation operation of Steinach. The rôle of chromosomes leads him to the subject of inherited characteristics. In the last chapter, entitled "Fertility," he takes up vitamins, artificial insemination, the birth rate and the vexed question of birth control—his nearest approach to argumentation. The book is written in direct, finished, judicial style. It is crammed with information and excellently illustrated, partly in color. Too technical for the reader without a background in biology, it is not technical enough for the student of medicine. It would be interesting and fairly profitable reading for the summer before entering medical school.

LE BACTÉRIOPHAGE DE D'HÉRELLE. Par Dr. Paul Hauduroy. Préface du Professeur Fernand Bezançon. Paper. Price, 10 francs. Pp. 212. Paris: E. Le François, 1925.

This little book gives a summary of the present knowledge of bacteriophages as viewed by the French followers of d'Hérelle. Consequently, bacteriophage is presented as a living agent or principle, a "virus of microbes," the discovery of which has opened the doors to new fields in science and new methods of treatment, the latter certainly being still in the earliest part of the experimental stage. The book is interesting as an introduction to the work on bacteriophage, but it cannot be accepted as containing any final solutions of the fundamental questions of the nature and significance of the bacteriophagic phenomenon.

Miscellany

REPORT OF MALARIA RESEARCH UNIT

In cooperation with the government of Palestine, the American Joint Distribution Committee maintains a malaria research unit at Haifa, which in 1923 conducted malaria control demonstrations to establish the possibility of malaria control at a low cost. The demonstrations provided information on the prevalence of malaria in Palestine and the types of mosquitoes and were an excellent means of educating the public in the value of malaria control. The engineering division of the research unit made detailed surveys of swamps and devised methods to eradicate them, demonstrating that many of the large swamps could be eliminated at no great expense. The Malaria Research Unit offered to contribute part of the cost of the work on condition that the inhabitants of the communities affected contributed the remainder, either in labor or in funds. The unit's laboratory examined thousands of blood films to determine the malaria index of communities and to establish diagnoses.

The topography and climate of Palestine make its malaria problem. There is a coastal plain from 4 to 20 miles wide from Acre to Gaza, which at Haifa turns east, cutting the hills transversely and joining the valley of the Jordan on the east with the coastal plain on the west. The hills between are chiefly limestone, in which winter rains erode deep holes and give rise to pools which retain water the year around. As the rain waters approach the sea, they are blocked by sand dunes and spread out along the coastal plain into a series of great swamps known as coastal marshes. Rain seeps into the hills and crops out in the foothills as springs which flow on into neglected wadis. The inhabitants in the hills build cisterns to store up the rain. Thus the sources of mosquitoes are obvious. There are leaky irrigation ditches also, too shallow to hold all of the water and too pervious to prevent seepage. The irrigation ditch has become a serious problem. Stagnant water exists everywhere, but especially in the highlands and near the coast. These mosquito breeding places will be eradicated when the natives learn sanitation and when the country is developed, the cisterns fitted with pumps and the springs properly exploited. Coastal swamps can be controlled only by radical measures.

The research unit organized nine malaria control demonstrations, each with a trained antimalaria inspector, who lived in the district, supervised the breeding places and had assistants who visited the districts to instruct local inspectors. They reported weekly to the central office, which controlled all of the demonstrations. The total area under control was about 600 square kilometers with a population of 13,580 Jews and 7,650 Arabs, and all other classes of the population represented. There was (*a*) a house-to-house search for hibernating mosquitoes; (*b*) a survey of the parasite and spleen rates followed by treatment; (*c*) a complete survey of breeding places in a certain radius of settlements, and (*d*) control of breeding places. Quinin was used only when mosquito control had broken down and then only as a temporary measure. The larvicides that proved most useful were (1) a paraffin-crude oil mixture containing 0.1 per cent. castor oil; (2) Paris green, and (3) a water solution of cresol. The addition of castor oil to the kerosene mixture greatly increased its spreading and penetrating power and was more economical, as 10 c.c. is plenty for 1 square meter, whereas 25 c.c. of paraffin alone or paraffin and crude oil is required for the same area. Paris green was useful in overgrown pools where kerosene mixtures were almost useless. It was diluted with fine sand or road dust

in the proportion of 1 part to 100; 10 gm. of this mixture was sufficient for 100 square meters of swamps; this did not kill the anopheles' eggs and pupae; consequently, the powder had to be applied every seven instead of ten days, as in the case of oil. For open reservoirs and irrigation wells in the orange groves, copper sulphate in a dilution of 1:1,000,000 was found sufficient to destroy the algae and keep the tank free from vegetation from three to four weeks.

The Bedouin and the shepherd come with their flocks from the East in the spring in search of pasture, move across the plains, settle along creeks, and change their camps frequently. They are usually heavily infected with malaria; the research unit found among them a parasite index as high as 25 per cent. and a spleen index of 80 per cent. or more. Thus, as they move from place to place they leave a trail of malaria behind them.

Prior to control work (in 1922), the minimum annual incidence of malaria in these areas was 50 per cent., and in at least three of the districts it was 100 per cent. The report shows the result of this control work graphically by tables prepared for the years just previous to the work and for the year 1923. There was a decided decrease in the incidence of malaria everywhere. In the Judea areas in 1923 there were practically no primary infections and relapses became fewer; extremely low rainfall in the winter of 1922-1923 facilitated the work. Progress was made in the Hedera district in 1923 until an explosive epidemic caused by an uncontrolled coastal marsh, 2.5 kilometers from the settlement, occurred in Hedera itself. The marsh was considered beyond the normal range of flight of mosquitoes, but the epidemic showed that plans for its control at a moderate cost had to be made. The Zichron Ja'cob area is skirted by the largest of the coastal marshes, and the control of mosquito breeding here was out of the question. Even in this area, there was a marked reduction in the incidence of malaria, achieved by (1) reduction of the number of carriers by intensive treatment; (2) eliminating breeding places in the immediate vicinity of settlements, and (3) systematic destruction of adult mosquitoes in houses. These "half measures" will not eliminate malaria in this area and eventually the Cabara swamps must be drained.

Taken as a whole, these demonstrations caused a notable reduction in malaria in seven of the nine demonstration areas, and while the amount varied in different areas, it was sufficient in all of them to indicate the possibility of malaria control. The average decrease for all the nine areas as compared with the incidence of malaria in 1922 was almost 50 per cent. The total cost of the work per control unit was about the same for all the districts since the salary of the malaria inspector was the principal item. The cost per capita varied, as a result of the varying density of population, and ranged from a minimum of 23 cents in Ekron to a maximum of $1.55 in Kinereth. These rates compare favorably with the cost of antimalaria demonstrations in the United States. The malaria research unit completed drainage operations in 1923 in the Ein Koreh seepage area, the Birket Atta Basin, at the spring east of the village of Yajur at Solim, the Wadi Little Zarain, the Jalud Swamp in the valley of Esdraelon, and the Wadi Wakkas in upper Galilee.

ANTIVACCINATIONIST DIES OF SMALLPOX

THE JOURNAL, September 26, contained a comment on smallpox statistics, pointing out that antivaccinationists were largely responsible for the increasing number of cases of this disease in the United States. *Health News* of the New York State Department of Health makes public the following instance:

Health News of February 2 carried an item mentioning a fatal case of smallpox in a schoolteacher. An interesting feature of this case has just been brought to our attention by the health officer of the municipality in which the teacher lived.

Following the teacher's death, mothers of two pupils in her class independently reported to the health officer that just before Christmas they had told the teacher that their children were to be vaccinated during the holidays. The teacher strongly advised against it on the ground that it "was a medieval custom, was harmful to the welfare of the child, and that deaths were occasionally caused by such vaccinations."

On January 12 this teacher died of smallpox.

Although she took her own advice, fortunately the mothers of her pupils did not do so.

Medicolegal

Revocation of Registration for Assisting Unregistered Person in Practicing Medicine—Valid Law

(Davis v. Calderwood et al. (Mass.), 146 N. E. R. 708)

The Supreme Judicial Court of Massachusetts in deciding that a final decree should be entered dismissing the plaintiff's bill says that he sought by this suit in equity to enjoin the defendants, who constituted the board of registration in medicine, from proceeding with a hearing against him pursuant to a notice issued for him to show cause why his registration as a practitioner of medicine in that commonwealth should not be revoked. It is assumed that he would suffer irreparable injury in his property and personal rights if the defendants should proceed to revoke his registration, and that therefore in this suit he might question the constitutionality of the statute under which they were proceeding.

The statute regulating the practice of medicine and conferring powers of registration of physicians and of revocation of such registration for cause, has been before the court in numerous cases. Its constitutionality, although decided or assumed in all those decisions, was examined at large in *Lawrence* v. *Board of Registration in Medicine*, 239 Mass. 424, 132 N. E. 174. After a detailed analysis of the statute and a review of many authorities, its constitutionality was upheld. Further reflection affords no ground to doubt the soundness of that adjudication. It is affirmed.

The statute requires a hearing before a public board, at which this plaintiff may be represented by council and call witnesses, with provision for further hearing in court and for revision and reversal of the finding of the board if justice demands such action. Every constitutional right is protected. It was stated in the notice of hearing to be given this plaintiff that the specific charge against him was "alleged association with an unregistered person, to wit, James P. Coll, of 124 State Street, Springfield, Mass." Apparently this charge was framed under Section 2 of Chapter 112 of the General Laws of Massachusetts, whereby the board is empowered after hearing to "revoke any certificate issued by it and cancel for a period not exceeding one year the registration of any physician who has been shown at such hearing to have been guilty . . . of acting as principal or assistant in the carrying on of the practice of medicine by an unregistered person." The notice to be issued to a registered physician of such a hearing is not to be construed with technical strictness. It is to be assumed also that further specifications would be given on proper request in any instance when the subject-matter was not fairly set out in the initial notice. No such request appeared to have been made in the case at bar. Every presumption is to be made in favor of the regularity and fairness of the methods of procedure and of the proposed action of such a board.

The contention cannot be supported that assisting an unregistered person in practicing medicine is not a sufficient ground for the revocation or cancellation of a registration. Incidental means for enforcing and giving effect to a valid statute violate no constitutional rights. This provision stands on this point with the main provisions of the act.

Indictments and the Harrison Act—Tennessee Law

(Mitchell v. United States (U. S.), 3 Fed. R. (2d Series), 514)

The United States Circuit Court of Appeals, Sixth Circuit, in affirming a judgment of conviction of defendant Mitchell for selling narcotics in violation of the Harrison Act, says that two counts of the indictment expressly alleged that the defendant was a physician and was duly registered as such under the Harrison act, and did not allege that his disposition of the narcotic stated was not made to a patient and in the course of the physician's professional practice. While it would not be necessary to negative this matter of lawfully dispensing in the course of professional practice if the counts had not already carefully shown that the defendant was a registered physician, yet, when this was made to appear, it then became necessary to negative, not an exception to some-

thing already stated, or an exception found in the act, but an inference naturally to be drawn from the acts which had been stated; and, as it has been decided that the giving of a prescription is participating in the sale made by the filler, the court cannot draw the necessary inference of nonprescription from the mere fact that the counts alleged selling. Therefore the court holds that these counts were insufficient.

Three other counts were not open to this objection; nor were they defective because they did not allege that the prescriptions were filled. They stated that the defendant, being a physician, sold, dispensed and distributed morphin in the following manner: That he issued a prescription therefor, not in the course of his professional practice. A physician who issues a prescription, which is filled, thereby participates in or aids and abets a sale. The allegation of sale or delivery implies a completed act, and when it is said that there was a sale through a prescription, it is, in effect, said that the prescription was filled.

At the time of the passage of the Harrison act it was believed by at least some reputable physicians that morphin addiction was a disease; that it was proper, in the treatment of this disease and to relieve pain and suffering, to prescribe morphin in limited quantities for these addicts; that to furnish the addict with a limited quantity of morphin for recurrent self-administration, even when the patient was not confined, was within the discretion of the physician; and that for a physician to furnish morphin in this way to an addict, when the physician in good faith believed it was necessary thus to treat the disease and relieve suffering, was a practice which was intended to be permitted by the express exemption found in the Harrison Act. In accordance with this idea, the Tennessee legislature passed a law intended to provide a system by which physicians who desired to do this kind of professional business would be measurably protected by what was, in effect, an official certificate that the morphin was necessary. As the construction of the Harrison act was developed by successive decisions of the Supreme Court of the United States it became apparent that this method was not within the stated exception, and that the practices approved of by some reputable physicians and expressly contemplated by the Tennessee statute were ipso facto (by the fact itself) violations of the Harrison act.

No Order for Excision of Cells or for Roentgenograms

(Andrus v. Fomfara (N. J.), 127 Atl. R. 788)

The Supreme Court of New Jersey says that in this action for damages the plaintiff contended that by reason of the defendant's negligence he was injured, and that a growth on the outside of his body, near the hip, was a result of such injury, and was a malignant and cancerous growth. The defendant desired not only to have the plaintiff examined by surgeons, but to have the order of examination provide that the surgeons might make an excision of some of the cells of the alleged cancerous growth sufficient in number to examine them under a microscope, contending that this was the best test to determine whether the growth was of a cancerous nature or not. If the court was not willing to direct that the plaintiff submit himself to an excision of a portion of the growth, then it was requested that the court direct that roentgenograms of the growth might be taken. If the court was unwilling to grant either of these requests, then the court was asked to make an order for an examination by surgeons without excision and without the making of roentgenograms. This application was made under Section 19 of the evidence act of New Jersey, which provides that on or before the trial of any action to recover damages for injury to the person the court may from time to time on the application of any party therein order an examination of the person injured as to the injury complained of, by a competent physician or physicians, surgeon or surgeons, in order to qualify the person or persons making the examination to testify in the case as to the nature, extent and probable duration of the injury complained of.

It will be observed that the statute gives to the court only the power to direct and order an examination of the person injured. The request of the defendant was for more than an examination. It amounted to a request for an operation. In this court's opinion the statute is not broad enough to give the court power to oblige a plaintiff to submit to an excision of cells from a growth in order to furnish testimony for the defendant, as to the nature of the plaintiff's ailment. No case was cited on the brief for the defendant which goes to this length. It has been held in compensation cases in New Jersey that an employee is not obliged to submit to an operation, even though physicians entertain the opinion that the operation would lessen the effect of the injury of the employee.

This court is also of the opinion that it should not direct that roentgenograms of the plaintiff be taken for the defendant. Roentgenograms sometimes result in the subject being seriously burned. In the case of *Boelter* v. *Ross Lumber Co*, 103 Wis. 324, 79 N. W. 243, the plaintiff had submitted to an examination by the roentgen-ray process, and had been burned. The court refused to compel a second examination by such a process, and this was held not to be an abuse of the discretion of the court. In this court's opinion, the only examination which this court should permit and order was an examination without excision or the right to take roentgenograms.

Musculospiroparalysis Not an Accidental Injury

(Chop v. Swift & Co. (Kan.), 233 Pac. R. 800)

The Supreme Court of Kansas, in affirming a judgment for the defendant, says that the plaintiff was employed in a packing plant, carrying links of cold sausage from one part of the plant to another. She picked up the links with her right hand and draped them on her left arm, taking them to a carrier. The links of sausage were quite cold and the temperature of the room was low. Her arm became so cold that she said there was a numbness, and buckets of warm water had been provided into which she would thrust her left arm after the removal of the sausage, and then would return for another load. After she had been there for thirty days she had pains in her arm which she testified she first called rheumatism. She went to a physician who treated her and afterward noticed wrist drop. He diagnosed the affliction as one of musculospiroparalysis, and for musculospiroparalysis, or wrist drop, the plaintiff asked an award of compensation under the workmen's compensation law, but the court holds that the injury could not be regarded as an accidental one within the meaning of the law.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Chicago, Oct. 20-24. Dr. Luther C. Peter, Chestnut and 20th Streets, Philadelphia, Secretary.

American Association of Railway Surgeons, Chicago, Oct. 21-23. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Secretary.

American College of Radiology and Physiotherapy, Chicago, Oct. 19-22. Dr. Roy W. Fouts, 121 South 33d Street, Omaha, Neb., Secretary.

American College of Surgeons, Philadelphia, Oct. 26-30. Dr. Franklin H. Martin, 40 East Erie Street, Chicago, Director-General.

American Public Health Association, St. Louis, Oct. 19-22. Mr. Homer N. Calver, 370 Seventh Avenue, New York, Executive Secretary.

Association of Military Surgeons of the United States, New York, Oct. 8-10. Col. J. R. Kean, U. S. A. Ret., Army Medical Museum, Washington, D. C., Secretary.

Central Neuropsychiatric Association, Ann Arbor, Oct. 23-24. Dr. Karl A. Menninger, Neuropsychiatric Clinic, Topeka, Kan., Secretary.

Central States Pediatric Society, Chicago, November 6-7. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Secretary.

Delaware State Medical Society, Wilmington, Oct. 13-14. Dr. W. O. La Motte, Industrial Trust Building, Wilmington, Secretary.

Interstate Postgraduate Assembly of America, St. Paul, Minn., Oct. 12-16. Dr. W. B. Peck, 82 Stephenson St., Freeport, Ill., Managing Director.

Kansas City Clinical Society, Kansas City, Mo., Oct. 5-9. Dr. James R. McVay, Rialto Building, Kansas City, Mo., Secretary.

Kentucky State Medical Association, Owensboro, Oct. 5-9. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Pennsylvania, Medical Society of the State of, Harrisburg, Oct. 5-8. Dr. Walter F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Southern Medical Association, Dallas, Texas, November 9-12. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.

Vermont State Medical Society, St. Johnsbury, Oct. 15-16. Dr. William G. Ricker, 29 Main Street, St. Johnsbury, Secretary.

Virginia, Medical Society of, Richmond, Oct. 13-16. Miss Agnes V. Edwards, 104½ West Grace Street, Richmond, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL for a period of three days. No foreign journals are available prior to 1920, nor domestic prior to 1923. Periodicals published by the American Medical Association are not available for lending, but may be supplied on order. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested).

Titles marked with an asterisk (*) are abstracted below.

American Journal of Electrotherapeutics and Radiology, New York

43: 301-326 (Aug.) 1925

Electrotherapeutics in Urology. V. C. Pedersen, New York.—p. 301.
History of American Electrotherapeutic Association. III. W. B. Snow, New York., and G. B. Massey, Philadelphia.—p. 307.

American Journal of Obstetrics and Gynecology, St. Louis

10: 153-312 (Aug.) 1925

*Cesarean Scar. O. H. Schwarz and R. Paddock, St. Louis.—p. 153.
*Weight and Dimensions of Human Placenta in Its Relation to Weight of New-Born Infant. F. L. Adair and H. Thelander, Minneapolis.—p. 172.
Preliminary Carcinoma of Cervix Uteri Treated with Radium in Woman's Hospital in State of New York. L. K. P. Farrar, New York.—p. 205.
*Gyneplastic Repairs Following Childbirth. J. L. Bubis, Cleveland.—p. 213.
Treatment of Secondary Anemia by Blood Transfusion Preceding Operation for Myoma Uteri and Pelvic Inflammatory Disease. B. M. Anspach and H. W. Jones, Philadelphia.—p. 222.
*Influencing Fertility of Female White Rat by Treatments with Placental Tissue. F. Kovacs, Baltimore.—p. 232.
Version; Indications and Contraindications. H. E. Miller, New Orleans.—p. 241.
*Symptoms Associated with Menstrual Cycle and Effects Thereon of Ovarian Therapy. H. Sharlit, J. A. Corscaden and W. G. Lyle, New York.—p. 246.
Rôle of Cervix in Sterility. I. W. Kahn, New York.—p. 254.
Limitations of Cesarean Section. C. J. Miller, New Orleans.—p. 260.
Brow Presentation an Attitude of Deflection; Case of Spontaneous Brow Transverse. D. A. Calhoun, Troy, N. Y.—p. 266.
Case of Uterus Duplex Bicornis with Double Vagina. J. W. Price, Louisville.—p. 269.

Cesarean Scar.—The healing of the incision in the wall of the guinea-pig uterus after abdominal hysterotomy is described by Schwarz and Paddock. It is concluded that the most important thing in the technic of elective cesarean section is to obtain good wound approximation with a minimum amount of suturing, with as little tension on the sutures as possible. A single row of buried interrupted sutures and an outer running suture after the method used by Williams should give the best results.

Relation of Size of Placenta to Baby.—Adair and Thelander report the results of a detailed study of 392 placentas. The main points bearing on the infant are: A positive correlation exists between the weight of the new-born and (*a*) the weight of the placenta; (*b*) the volume of the placenta, and (*c*) the surface area of the placenta. A low ratio of the weight of the baby to the weight of the placenta is found in prematures, very small babies which are really on the borderline of prematurity, and in pathologic cases, especially those where toxemia of pregnancy is present. A high ratio is found chiefly in postmature or large infants. A marginal insertion of the cord indicates a pathologic placenta and almost always means a small baby.

Gyneplastic Repairs After Childbirth.—Bubis urges to repair old lacerations of the genitalia shortly after childbirth. From an economic standpoint, it saves the patients, hospitals, and community many dollars and hospital days. Operative deliveries or the presence of lochia do not seem to interfere with the healing of the tissues. Subsequent deliveries are not complicated by the previous repairs. If a new laceration occurs, either spontaneously or by episiotomy, it is repaired immediately after the delivery.

Effect of Placental Tissue on Fertility.—Kovacs believes that he has established the fact that some important biologic change follows the parenteral introduction of fresh placental tissue into the female which results in a temporary checking of fertility.

Effect of Ovarian Therapy on Menstrual Cycle.—The clinical features and course in a group of 132 women who complained among other symptoms of hot and cold "flashes" and who received as therapy desiccated whole ovary are reported by Sharlit, Corscaden and Lyle. They have been most favorably impressed with the value of this therapy.

American Journal of Physiology, Baltimore

73: 505-683 (Aug.) 1925

So-Called "Reversed" Hemolysis; Mechanism of Hemolysis. M. L. Schroeder and G. N. Stewart, Cleveland.—p. 505.
Changes in Physiologic Action of Insulin Induced by Exposures to Ultraviolet Light. M. M. Ellis and E. B. Newton, Columbia, Mo.—p. 530.
*Absorption of Undigested Protein from Alimentary Tract as Determined by Direct Anaphylaxis Test. J. P. Hettwer and R. A. Kirz, Milwaukee.—p. 539.
Endurance of Pressure by Nerve Cells and by Interstitial Cells. E. C. Cole, Cambridge, Mass.—p. 547.
*Changes in Blood Pressure During Sleep. C. Landis, Minneapolis.—p. 551.
Thermomyograms in Response to Nerve Stimulation. I. Initial Rise, as Registered by Einthoven's Galvanometer. C. D. Snyder and C. L. Gemmill, Baltimore.—p. 556.
Pseudocryptorchidism in Albino Rat. C. P. Stone and W. R. Miles, Stanford University, Calif.—p. 571.
Activity Studies on Male Castrated Rats with Ovarian Transplants; Correlation of Activity with Histology of Grafts. G. H. Wang, C. P. Richter and A. F. Guttmacher, Baltimore.—p. 581.
Electrical Response to Illumination of Eye in Intact Animals, Including Human Subject, and in Decerebrate Preparations. H. K. Hartline, Baltimore.—p. 600.
Nature of Conduction of Impulse in Relatively Refractory Period. H. S. Gasser and J. Erlanger, St. Louis.—p. 613.
Circulatory Responses to Static and Dynamic Exercise. H. L. White and R. M. Moore, St. Louis.—p. 636.
Studies on Radiated Proteins. I. Coagulation of Egg Albumin by Ultraviolet Light and Heat. J. H. Clark, Baltimore.—p. 649.
*Action of Epinephrin on Respiration. L. B. Nice and A. J. Neill, Norman, Okla.—p. 661.
Heat Regulation and Water Exchange. IX. Mechanism of Cold Anhydremia and Edema. H. G. Barbour and W. F. Hamilton, Louisville.—p. 665.
Beginning of Suprarenal Function in Embryo Chick. B. R. Lutz and M. A. Case, Boston.—p. 670.

Absorption of Undigested Protein from Alimentary Tract.—The experimental evidence obtained by Hettwer and Kirz support the assumption that an unusual increase of intraintestinal pressure (as a result of stasis) is the essential factor in the absorption, and sufficiently rapid absorption, of an amount of undigested horse serum adequate to cause symptoms of anaphylactic shock in previously sensitized guinea-pigs, or to sensitize normal guinea-pigs, provided the dose is suitably adjusted.

Changes in Blood Pressure During Sleep.—Tracings of blood pressure were taken by Landis by the Erlanger method, together with auscultatory readings of systolic and diastolic pressure, while the subject went to sleep, during a short nap and during the period of awakening. As the subject went to sleep, the pressure gradually dropped from approximately 110 mm./74 mm. to 94 mm./68 mm. Certain of the curves assumed a definite pressure rhythm during this period. During sleep there appeared a more pronounced and more uniform pressure rhythm than when the subject was awake. Awakening as the result of sudden stimuli gave curves where the pressure rose very rapidly from a sleep level of 94 mm./68 mm. to 110 mm./74 mm. or higher. Natural awakening, other than that caused by sudden stimuli, was marked by a more gradual return to the normal waking pressure. Bodily position, whether reclining or semierect, had little or no effect on the blood pressure during sleep. This together with other considerations seem to indicate that the change in circulation is resultant from, rather than causative of sleep.

Action of Epinephrin on Respiration.—Nice and Neill state that within limits small doses of epinephrin injected into the blood stream of anesthetized cats, dogs and rabbits may cause an increase in the depth of respiration, while large doses produce a reversal effect or shallowness. There is a range in which the effects of epinephrin on respiration are independent of its influence on blood pressure. Large doses, however, invariably produce apnea and a rise in blood pressure. These results do not support the anemic theory.

American Journal of Roentgenology and Radium Therapy, New York

14: 105-206 (Aug.) 1925

Cholescystography by Oral Administration of Soluble Radiopaque Salts. C. S. Oakman, Ann Arbor, Mich.—p. 105.
Diverticulum of Stomach. I. Gray, Brooklyn.—p. 110.
Roentgenographic Demonstration of Adenoids. C. C. Grandy, Fort Wayne, Ind.—p. 114.
Use of Absorbable Filter with Bare Tubes of Radium Emanation. A. C. Heublein, Hartford, Conn., and D. Quick, New York.—p. 116.
Limitations of Radium Therapy in Dermatology. L. M. Taussig, San Francisco.—p. 121.
Radium Therapy in Dermatology. G. A. Robinson, New York.—p. 130.
Van Den Bergh Reaction after Deep Roentgen-Ray Irradiation. G. Cameron and H. Flecker, Melbourne, Victoria, Australia.—p. 133.
Deep Roentgen-Ray Therapy of Mammary Carcinoma. W. A. Evans and T. Leucutia, Detroit.—p. 135.
Convenient Radium Knot. P. D. Cameron, Wellington, N. Z.—p. 161.

American Journal of Syphilis, St. Louis

9: 413-588 (July) 1925

Intravenous Use of Metallic Mercury (Mercodel) in Treatment of Syphilis. J. J. Rothwell and E. R. Maloney, New York.—p. 413.
*Sulpharsphenamin. I. Value in Acquired Syphilis. J. C. Fox, New Haven, Conn.—p. 436.
*Id. II. Value in Congenital Syphilis. E. C. Dunham, New Haven, Conn.—p. 463.
*Noninfectivity of Blood in Tertiary Syphilis. W. L. McNamara, Boston. —p. 470.
Frontal Sinusitis Complicated with Profound Syphilis. G. W. MacKenzie, Philadelphia.—p. 479.
*Neurosyphilis. V. Comparison of Arsenic in Spinal Fluid Following Direct Administration of Silver Arsphenaminized Serum. L. H. Cornwall and C. N. Myers, New York.—p. 485.
*Studies in Syphilis. XVII. Penetration of Arsenic into Spinal Fluid After Intravenous Injections of Tryparsamide. J. A. Fordyce and C. N. Myers, New York.—p. 490.
Generalized Cutaneous Syphilis: Clinical Differentiation. II. Papular Syphilide. H. Goodman, New York.—p. 502.
Atypical Bulbar Paralysis Simulating Aneurysm. H. W. Dana, Boston. —p. 526.
Clinical Study of 372 Cases of Syphilis Over Period of Six Years. H. S. Applebaum, J. Levine and J. E. Fisher, Cleveland.—p. 531.
*Wound Healing in Syphilis. W. C. Menninger, Topeka, Kan.—p. 545.
Clinic Routine for Treatment of Syphilis. A. J. Casselman, Trenton, N. J.—p. 557.
Hyposulphite of Sodium in Treatment of Old Mercury and of Recent Years Arsenic Fast Syphilis. R. Wernigk, Los Angeles.—p. 563.
*Unilateral Wrist Drop Due to Syphilis; Cases. T. P. Murdock, Meriden, Conn.—p. 566.
Improved Graphic Form for Reporting Results of Kolmer's Quantitative Complement Fixation Test in Syphilis. R. A. Kilduffe, Atlantic City, N. J.—p. 569.

Sulpharsphenamin in Acquired Syphilis.—Fox gave sulpharsphenamin intramuscularly or subcutaneously in doses as high as 0.6 gm. without causing a significant local reaction, except in an occasional case, provided a solution of 33 per cent. concentration was used. The intramuscular or subcutaneous administration of the drug in patients in the secondary stage produced a slower healing effect on cutaneous and mucous lesions than is usually obtained with the other arsphenamins given intravenously. However, the end-results, as judged by absence of clinical recurrence and effect on serology, compare favorably with those produced by the other arsenicals. No superiority was shown for the drug in the treatment of patients with neurosyphilis, either when administered in the first instance or when given to patients known to be resistant to the other forms of treatment. Evidence was not obtained that the drug possessed particular value in reversing the serology of the Wassermann fast cases or in influencing favorably the clinical course of patients with disease of the cardiovascular system. The drug was found useful in treating three patients who had previously developed "shock" or "nitritoid" reactions after intravenous injections of the other arsphenamins. The route of administration seemed to play little or no part in determining the therapeutic effect, but was found to be of considerable importance as far as systemic toxic reactions were concerned. In this connection intramuscular injection was found to be the method of choice. Dermatitis was found to have a relatively high incidence, showing a total of six cases in 678 injections. It is important that three of these occurred among the 110 injections administered intravenously as compared with only one among 302 given intramuscularly. One patient, previously known to be intolerant to the other arsenicals, developed a severe grade of anemia of an aplastic type, but without purpura, following one course of seven subcutaneous treatments of 0.4 gm. each.

Sulpharsphenamin in Congenital Syphilis.—Dunham finds that sulpharsphenamin is a drug which has a distinct place in the treatment of congenital syphilis. It seems to be as effective an agent as neo-arsphenamin. There is a great advantage to the pediatrician in having at hand a form of arsenic which can be prepared easily and injected subcutaneously. It can be used in high concentration and local and general reactions need not be dreaded.

Noninfectivity of Blood in Syphilis.—Ten nonsyphilitic cases were transfused by McNamara from six syphilitic donors in the late stage of the disease. Four patients received one transfusion each, three received two, and three received three transfusions. One patient received blood from three donors. There was a marked improvement over the previous anemic condition in all cases. None of the recipients developed clinical evidence of syphilis or a positive Wassermann reaction during a period of observation of from sixteen to twenty-six weeks. From observations made on these cases and several others of which no accurate clinical record could be kept, McNamara concludes that it is ordinarily safe to use the blood of tertiary syphilitics for transfusion.

Arsenic Content of Spinal Fluid After Administration of Arsphenaminized Serum.—Six determinations of the arsenic content of the spinal fluid were made by Cornwall and Myers in a case of general paresis. On four occasions these determinations followed, at intervals of from six to thirteen days, the direct administration of arsphenamin to the spinal fluid. The arsenic averaged 16.77 mg. per hundred grams. On two occasions the administrations followed, at intervals of from four to eight days, the administration of arsphenamin in auto-arsphenaminized serum. No arsenic was present in one of these examinations and in the other the quantity was too small to be quantitatively determined but was detected qualitatively and, therefore, recorded as a trace.

Penetration of Arsenic into Spinal Fluid After Administration of Tryparsamide Intravenously.—Examination made by Fordyce and Myers of the spinal fluids from patients receiving the routine type of treatment with intravenous injections of tryparsamide showed that in this group 14 per cent. showed the absence of arsenic. The amounts of arsenic found do not exceed those found by other methods of administration. In order to obtain these results, it is necessary to introduce seven and one-half times as much drug as in other cases. In other words, the dosage is extremely large as compared with other drugs. Due to the rapid excretion of tryparsamide, the amount of arsenic available for penetration is extremely small after the twenty-four hour period. Experimentally, examination of the brain shows that nine times the arsenic concentration is maintained in the brain after silver arsphenamin with the use of one-fifteenth the amount of arsenic injected. It is shown that tryparsamide does not possess an unusual power of arsenic penetration into the central nervous system. Therapeutic penetration is hypothetical in that other factors which may enter into this condition are not available either experimentally or clinically.

Wound Healing in Syphilis.—Twenty-two surgical cases in which syphilis was present, as indicated by strongly positive Wassermann tests, are discussed by Menninger. Sixteen cases (72 per cent.) presented some difficulty in wound healing; the remaining six cases (28 per cent.) healed by primary union. Fourteen cases were infected in varying degrees (63.6 per cent.) five of which were potentially clean operative wounds. In four cases receiving preoperative treatment three presented some postoperative difficulty. All had positive Wassermann tests. Patients with syphilis as evidenced by a positive Wassermann test at the time of operation, despite the fact that they may have been treated, cannot be operated on with absolute impunity, although their postoperative course may be uneventful. Untreated cases of active syphilis may develop postoperative difficulty in wound healing. The rôle played by syphilis is not determined. In some cases pyogenic bacteria of low virulence grow luxuriantly; in others there is a poor tendency to union without gross infection; and in others, there is no postoperative difficulty whatever. Pre-

operative syphilitic treatment is desirable and postoperative treatment advisable, although the effectiveness of such treatment, so long as the Wassermann test remains positive, as an aid to the wound healing is undetermined.

Unilateral Wrist Drop Due to Syphilis.—Two cases of unilateral wrist drop due to syphilis are reported by Murdock. He feels that the condition is probably more common than was formerly believed.

Annals of Clinical Medicine, Baltimore

4: 89-182 (Aug.) 1925

Cardiac Neuroses. W. A. Bloedorn, Washington, D. C.—p. 89.
Neurologic Opportunities for Internist. H. C. Macatee, Washington, D. C.—p. 94.
Causes and Differential Diagnosis of Headache. W. C. Moore, Washington, D. C.—p. 98.
*Pathology of Paralysis Agitans. W. Freeman, Washington, D. C.—p. 106.
*Mental Reactions in Sequelae of Epidemic Encephalitis. S. A. Silk, Washington, D. C.—p. 117.
Traumatic Epilepsy. A. Gordon, Philadelphia.—p. 140.
*Acute Poliomyelitis; Detroit Epidemic. J. T. Watkins and E. D. McKenzie, Detroit.—p. 149.
*Etiology of Urticaria and Allied Dermatoses. F. J. Eichenlaub, Washington, D. C.—p. 170.

Pathology of Paralysis Agitans.—Two cases of paralysis agitans, one "idiopathic" and one postencephalitic, were studied in detail by Freeman. In each case there was severe degeneration of the substantia nigra without serious involvement of any other part of the brain. The findings in these two cases support Tretiakoff's contention that the substantia nigra is severely altered in paralysis agitans, and tend to show that this degeneration is the actual cause of the disease. The alterations in other parts of the brain were insignificant in comparison.

Mental Reactions as Sequelae of Epidemic Encephalitis.—In the ten cases reported by Silk there appears to be a definite relationship of influenza to the various syndromes presented. The so-called parkinsonian syndrome, which appeared following cases of typical attacks of lethargic encephalitis, did not differ clinically from cases in which no such attacks were observed. Influenza, however, was present in nearly all cases. It must, therefore, be regarded as either a very mild inflammatory process of the encephalon, which, though capable of producing such serious and lasting sequelae, passed practically unnoticed during its acute stage, or these sequelae are due to influenza and the so-called attacks of lethargic encephalitis as the more virulent forms of influenza of the cerebral type. In the cases of this series there was no tendency to improvement and in some the disease was rapidly progressive.

Epidemic Acute Poliomyelitis.—A total of 300 cases had been reported to about December 1, and a mortality of 14.67 per cent. returned in the Detroit epidemic of acute poliomyelitis which is analyzed by Watkins and McKenzie. Etiologic studies were conducted and confirmed by Rosenow's bacteriologic studies. In this group of cases those displaying spinal paralyses predominated numerically, as is true in most reported series; the bulbar group came next; those showing progressive ascending or descending involvement of the Landry type were third, as expressed by numbers, and lastly, cases with a predominance of cerebral and meningeal symptoms. The observations on the clinical pathology of the disease agree quite well with the pictures previously described. As to the end-results, there were thirty deaths. The cases presenting a predominance of cerebral symptoms with little peripheral neuron involvement contributed least to the mortality list and showed fewer residual paralyses. Of the bulbar group about 20 per cent. recovered. In these, disturbance of deglutition was the most outstanding feature when they left the hospital. Among the progressive group there were more deaths proportionately than in all other types. Aside from general measures immune homologous serum and Rosenow's immune horse serum were tried in about forty cases. Convalescent serum was collected on the twentieth day of the disease and inactivated, and nineteen cases were treated. Of this number, five, or 26.3 per cent., were apparently cured; 2, or 10.5 per cent., improved, and 12, or 63.1 per cent., showed no effect. The dosage employed was 20 c.c. repeated once, usually the following day. The intraspinal and intramuscular routes were the ones used. Intraspinally, 15 c.c. was the average dose. Rosenow's serum was employed in thirty cases and of this number, 16, or 53.33 per cent., were apparently cured; 3, or 10 per cent., were improved but would have recovered without it; 2, or 6.66 per cent., showed doubtful effects; 9, or 30 per cent., showed no change. Early the latter serum was adjudged of little value, probably because of the small doses used. The average was 20 c.c. total. Later, however, the dose was increased to five or ten times this amount and with this better results seemed to come. The intravenous and intramuscular routes of administration were the ones of choice.

Etiology of Urticaria.—Study by Eichenlaub of fifty-eight cases of chronic urticaria shows that nearly half of the cases (twenty-eight) were associated with other skin diseases. The probable etiology was determined in fifty cases. The therapeutic result in this group was directly proportionate to the ability to find and successfully treat the cause.

Annals of Surgery, Philadelphia

82: 193-320 (Aug.) 1925

*Thrombosis and Embolism. J. A. Vietor, New York.—p. 193.
*Intracranial Tumors and Abscesses Causing Communicating Hydrocephalus. W. E. Dandy, Baltimore.—p. 199.
Lengthening the Soft Palate in Cleft Palate Operations. G. M. Dorrance, Philadelphia.—p. 208.
*Epigastric Pain Symptom of Esophageal Obstruction. P. P. Vinson, Rochester, Minn.—p. 212.
Improved Goiter Technic. J. L. DeCourcy, Cincinnati.—p. 215.
Hernia of Lung. J. G. Montgomery, Kansas City, Mo., and H. Lutz, Augusta, Kan.—p. 220.
Diagnosis and Surgical Treatment of Diseases of Gallbladder. F. E. Bunts, Cleveland.—p. 232.
*Wandering Spleen with Torsion of Pedicle. J. E. Sutton, New York.—p. 239.
Spontaneous Rupture of Splenn. M. G. Wohl, Omaha.—p. 246.
Diverticula of Jejunum. N. S. Rothschild, Philadelphia.—p. 250.
Appendicitis and Transposition of Viscera. B. C. Willis, Rocky Mount, N. C.—p. 256.
*Ligation and Drop Treatment of Appendectomy Stump. J. J. Maloney, Cincinnati.—p. 260.
*Hernia of Bladder. R. E. Farr and C. W. Brunkow, Minneapolis.—p. 264.
Granuloma Inguinale. R. R. Best, Omaha.—p. 273.
*Cysts of Iliopsoas Bursa. W. D. Gatch and W. T. Green, Indianapolis.—p. 277.
Vertebral Epiphysitis; Case. P. Lewin, Chicago.—p. 286.
Closed Reduction of Acute Dislocations of Semilunar Carpal Bone. H. E. Conwell, Fairfield, Ala.—p. 289.
*Arteriovenous Fistula; Case. T. H. Thomason, Fort Worth, Texas.—p. 293.

Thrombosis and Embolism.—Vietor has studied twenty-one cases of fatal pulmonary embolism occurring in 12,615 operations. Necropsies were obtained in nine cases and showed a thrombosis of the femoral vein in four cases. In one case there was a thrombosis of the common iliac vein and the inferior vena cava. In two cases a wound inspection only was allowed so the condition of the femoral veins was undetermined. In the remaining two cases, while a complete necropsy was performed, no existing thrombosis could be demonstrated. The patients who died of a pulmonary embolus gave no clinical sign of a preexisting phlebitis or thrombosis, except in a case of carcinoma of the pancreas. In this case the patient had a hopeless condition and was gradually dying of a metastatic growth in his liver. On the thirteenth postoperative day a swelling of the left leg was first noted and on the twenty-seventh day hemiplegia developed. Death occurred on the thirty-first day after operation apparently from cachexia, but at necropsy a large pulmonary embolus with thrombosis of the common iliac and inferior vena cava was revealed. One patient with inguinal hernia complained of a pain in his right leg on his third postoperative day, but periodic examination was negative for clinical evidence of a phlebitis. He died on the eleventh day and at necropsy a thrombosis of the right femoral vein was found.

Intracranial Tumors Cause Communicating Hydrocephalus.—Pathologic evidence is offered by Dandy to show that hydrocephalus of the communicating type may be caused by tumors and abscesses when so situated that they obstruct the cisternal conduit under the brain stem. Postmortem

injections of India ink proved the cisterna pontis to be completely blocked in each case. The cause of hydrocephalus in these cases is precisely the same as in the more common instances resulting from adhesions after the spontaneous cure of meningitis. All cases of hydrocephalus, whether of the communicating or noncommunicating type, have fundamentally the same underlying cause, an obstruction in the system of spaces through which cerebrospinal fluid circulates. The result of any such obstruction is reduction of the spaces in which cerebrospinal fluid is absorbed.

Epigastric Pain Symptom of Esophageal Obstruction.—Two cases are cited by Vinson which illustrate how the pain of cardiospasm may be confused with that of disease in the gallbladder.

Wandering Spleen with Torsion of Pedicle.—Sutton's patient, a boy aged 13, was awakened from a sound sleep by intense cramplike pain in the epigastrium. He vomited several times but the pain continued. During the morning a good bowel movement gave slight relief for a short time. Several hours before coming to the hospital, pain became more intense in the right lower abdominal quadrant. He was seen by his family physician, who made a diagnosis of "probable acute appendicitis." On the day prior to the onset of his abdominal pain the patient had a chill and an intensely sore throat developed. Up to the time of this illness he had attended school regularly, had done no violent exercise, and had not fallen or injured his abdomen. There was no history of previous abdominal pain, indigestion or constipation. His genito-urinary history was negative. The abdomen was flat, symmetrical and held rigidly throughout its entire extent. On palpation, there was acute tenderness in the region of the cecum and sudden release of pressure produced acute pain. Pressure over the splenic flexure of the colon did not produce pain at McBurney's point when the patient coughed. Across the entire lower abdomen the muscles were held very tensely and what appeared to be boardlike rigidity was present. No masses were recognized by abdominal palpation. A laparotomy was performed. Occupying and completely filling the pelvis was a mass which was recognized to be the spleen. It was enlarged to more than three times its normal size. The surface was smooth, glistening, free from fibrin or adhesions, and its color was bluish-black. The pedicle, on which it had rotated 360 degrees, was 10 inches long and looked like a large umbilical cord. No pulsations could be felt at the hilum of the spleen. The spleen was easily delivered from the pelvis and removed. The boy was well at the time of the last examination, four months later.

Ligation and Drop Treatment of Appendix Stump.—The ligation and drop method, leaving the stump free in the abdominal cavity, Maloney says, is the ideal procedure because it is more easily and readily performed with lessened mortality and morbidity rate. Any method of burying the stump in the cecal wall is unphysiologic and unsurgical and is followed by a greater percentage of complications and sequelae.

Hernia of Bladder.—In all inguinal and femoral hernias in people past middle life, Farr and Brunkow insist that the possibility of the involvement of the bladder should be kept in mind. In any case a positive diagnosis can be made by means of the roentgen ray.

Cysts of Iliopsoas Bursa.—Gatch and Green report one case and summarize the clinical data on affections of the iliopsoas bursa.

Femoral Arteriovenous Fistula.—A case of arteriovenous fistula of the femoral artery and vein is presented by Thomason showing Branham's sign and associated blood pressure variations, due to an increase in blood volume caused by the fistula; cardiac dilatation and hypertrophy—the result of increased volume flow through the heart incident to the production of the fistula; slight dilatation of the proximal artery—due to the small size of the fistulous opening as compared to the cross section of the artery; marked development of the collateral circulation following formation of the fistula and unusual occurrence of auricular fibrillation three weeks after operation, ascribed to failure of the heart following damage to the myocardium at the time of repair of the fistula.

Boston Medical and Surgical Journal

193: 331-380 (Aug. 20) 1925

Care of Pregnancy. W. C. Danforth, Evanston, Ill.—p. 331.
Joint Fractures. P. D. Wilson, Boston.—p. 338
*Clinical Spirography. II. Bronchial Asthma. S. G. Mudd, Boston. —p. 345.
*Id. III. Variety of Respiratory Abnormalities. S. G. Mudd, Boston. —p. 349.

Spirography in Bronchial Asthma.—The type of breathing in the asthmatic patients studied by Mudd showed a prolongation of the expiratory phase in most cases. The expiration-inspiration ratio in cases of marked bronchial asthma varied from 1.5 to 2.1, as compared with an expiration-inspiration ratio of 1.3 to 1.5, in normal subjects. The respiratory records indicate the manner in which the breathing in asthma is facilitated by the use of epinephrin. The volume per breath is usually considerably increased, the respiratory rate reduced, the minute volume increased, and the expiration-inspiration ratio diminished following the injection of the drug. The vital capacity was increased in all instances. In one case the volume per breath was increased, the respiration rate greatly reduced, but the total ventilation was not greatly changed, following epinephrin. In a very severe case the expiration-inspiration ratio and the respiratory rate were not materially altered by the drug. The time required for the asthmatic to complete the supplemental phase during a vital capacity tracing was considerably prolonged, before as well as after epinephrin. In severe cases of asthma, the effect of epinephrin, even in large doses, was less marked and more transient in character than in mild cases. Atropin is of some value in the treatment of asthma; however, epinephrin is much more efficacious. Oxygen therapy is said to be of questionable value in asthma.

Spirography in Respiratory Abnormalities.—Respiratory tracings are reported on by Mudd of a number of respiratory abnormalities, including fracture of the sixth cervical vertebra, psychoneurosis, effort syndrome, lobar pneumonia, cardiac dyspnea, postoperative massive collapse of the lung, diabetic acidosis and uremic poisoning.

Canadian Medical Association Journal, Montreal

15: 771-882 (Aug.) 1925

Uremia and Nephritis. J. Meakins.—p. 771.
*Determination of Kidney Function in Private Practice. G. H. Agnew. —p. 778.
*Quinidin Sulphate in Cardiac Irregularities. R. A. Jamieson.—p. 782.
*Erythema Nodosum. W. T. Connell.—p. 785.
*Test for Hexyl-Resorcinol in Body Fluids. D. C. Elliot and H. G. Barbour.—p. 787.
Abortions and Their Treatment. S. Kobrinsky.—p. 789.
Modern Advances in Diagnosis of Tuberculosis. A. H. W. Caulfeild. —p. 793.
Tuberculosis in Child. Preventive Rôle of Open Air School, Summer Camp and Preventorium. J. H. Elliot.—p. 796.
Most Important Agencies in Provincial Campaign Against Tuberculosis. R. G. Ferguson.—p. 799.
*Case of Adolescent Myxedema. J. R. Davidson.—p. 803.
*Atelectasis of Lung. H. A. Farris.—p. 808.
Tuberculosis Survey of School Children in Alberta, 1925. A. H. Baker. —p. 816.
Traveling Diagnostic Clinic for Diseases of Lungs. G. C. Brink.—p. 817.
Treating Tuberculosis in Dry Climate Belt. A. D. Lapp.—p. 819.
Evaluation of Tuberculosis. A. C. Jost.—p. 822.
*Rôle of Ultraviolet Ray in Treatment of Tuberculosis. H. P. Wright.—p. 828.
Results of Artificial Pneumothorax Treatment at Muskoka Institutions of National Sanitarium Association. W. B. Kendall.—p. 832.
Standards in Chest Radiography. P. M. Andrus.—p. 836.
Thymic Death in Child with Glandular Family History. W. A. McIntosh. —p. 839.
Case of Silicosis with Necropsy. A. R. Riddell.—p. 839.
Tuberculosis of Inguinal Glands. F. H. Pratton.—p. 841.

Determination of Kidney Function.—Agnew points out that there is such a wide margin of safety that incipient or slight changes in the kidneys are not indicated by tests. For instance, three fifths of the kidney tissue must be destroyed before the blood urea is raised. These tests are more to estimate the extent of the damage done. Also it should be remembered that focal nephritis may give albumin, pus and blood in the urine without in any way affecting the kidney function. This is due to the wide margin of safety provided by nature. It is a long way from the kidney to the eye, but

an ophthalmoscopic examination is advisable in every suspected case. To study the retina is like holding a divided kidney in the hand.

Quinidin Sulphate in Heart Irregularities.—The results obtained from the use of quinidin sulphate in fifty-two cases of heart disease are presented by Jamieson. Of this number forty-nine were suffering from auricular fibrillation and three from paroxysmal tachycardia. The majority of the patients received a preliminary course of digitalis. Of the forty-nine cases of fibrillation, twenty-six reverted to normal rhythm. The permanence of normal rhythm was varied from a few days to two years. In the majority fibrillation has reappeared within several weeks; a number of this latter group have had two or more courses of treatment with varying success. Two patients have maintained a regular rhythm for a period of more than two years. Slightly better results were obtained in those patients in whom no valvular defect was demonstrated. Among this group there have been four deaths. Of the three patients who were treated for paroxysmal tachycardia, one received no benefit; a second was very markedly improved; the third, still under treatment, has had total freedom from an attack for seven weeks, which is an exceptionally long period for him. From a study of these results it would appear that in carefully selected cases the use of quinidin sulphate in the treatment of cardiac irregularities considered is justifiable. The most important contraindication would seem to be high grades of myocardial damage as demonstrated by either clinical or electrocardiographic examinations. The production of embolism following the use of quinidin is the danger which is emphasized. Judging from the fatal cases here reported, three of which came to necropsy, there must be some other factor, and probably the one suggested by Lewis, that with a changing rhythm there may be a ventricular standstill for a sufficiently long period to cause death, is the one to be feared.

Erythema Nodosum Result of Focal Infection.—Connell believes that erythema nodosum is a manifestation of focal streptococcal infection in which tonsils, teeth and nasal sinuses play the important rôle of infective foci.

Test for Hexylresorcinol in Body Fluids.—The test employed by Elliot and Barbour is a modification of one of the U. S. P. tests for resorcinol, some of which give no reaction for hexylresorcinol. To 2 c.c. of urine or fluid to be tested 0.25 c.c. each of 40 per cent. potassium hydroxid and chloroform is added. This mixture is boiled gently until one minute after the chloroform has been driven off. A pink color develops, usually strongest after standing for five minutes. When doubt exists as to the development of the color an unboiled control test should be performed. In distilled water hexylresorcinol can be detected in dilution of 1:100,000; in urine, 1:50,000; in serum, 1:25,000. If a 1:5,000 dilution of hexylresorcinol is added to bile, a pink color can be detected in the foam after the reagents have been boiled.

Adolescent Myxedema.—Davidson's patient was 17 years of age. Besides the myxedema she also had a nephrosis and tetany of parathyroid origin. She was treated successfully with thyroid and Collip's parathyroid extract. The patient died and a necropsy was made. No definite abnormality was found, except in the thyroid, parathyroids and kidneys. The postmortem findings are in agreement with the original diagnosis of subthyroidism, subparathyroidism and chronic nephrosis.

Atelectasis.—Farris reports seven cases to demonstrate that atelectasis of the lung occurs not infrequently, especially among patients in a tuberculosis institution, and that it is frequently confused with fibrosis.

Ultraviolet Ray Therapy of Tuberculosis.—Wright says that all forms of tuberculosis, except pulmonary and meningeal, are greatly improved by ultraviolet therapy. In active pulmonary tuberculosis and in tuberculous meningitis, ultraviolet therapy is contraindicated. Bone tuberculosis, skin tuberculosis, tuberculous adenitis, tuberculous peritonitis and pleurisy with effusion are among the forms most successfully treated. In the absence of heliotherapy, ultraviolet radiations from either the carbon arc or the mercury vapor lamp are the logical substitute; but, with artificial ultraviolet therapy, fresh air must be an important adjunct of the treatment. If it is felt in institutions particularly interested that heliotherapy itself must be applied, quartz window panes may be substituted for glass. After all, however, pure sunlight and fresh air are the real thing which artificial phototherapy is trying to imitate—and ignorance and greed may combine to form a so-called substitute for the ultraviolet ray which the superstitious and gullible public will accept as the real thing. The real use of these lamps, then, is to "carry on" when and where sunlight is not to be had.

Florida Medical Association Journal, Jacksonville

12: 27-58 (Aug.) 1925

Cancer of Lip; Resultant Deformity; Plastic Repair. J. E. Boyd, Jacksonville.—p. 27.
Plastic Repair of Mutilating Operations of Lip and Cheek Following Radical Removal of Carcinoma. F. A. Copp, Jacksonville.—p. 29.
Focal Infection as Related to Systemic Disease. A. T. Summers, Miami.—p. 35.
Traumatic Corneal Injuries; Cases. P. M. Lewis, Orlando.—p. 37.
Fifty Years of Health Work in Florida. II. J. Y. Porter.—p. 40.
Endarteritis Obliterans. H. E. Palmer, Tallahassee.—p. 43.
Sporotrichosis; Cases. S. R. Edwards, Fort Lauderdale.—p. 43.

Georgia Medical Association Journal, Atlanta

14: 312-356 (Aug.) 1925

Irritable Bladder. W. L. Bazemore, Macon.—p. 312.
Report on 2,000 Infants Fed on Dry Milk. M. M. McCord, Rome.—p. 316.
*Intravenous Mercurochrome in Treatment of Acute Articular Rheumatism. J. F. Covington, Moultrie.—p. 320.

Mercurochrome in Acute Articular Rheumatism.—Covington relates the case of his daughter, aged 9, who following an attack of tonsillitis developed an acute articular arthritis involving all the joints of her extremities. One intravenous injection of 10 c.c. of a 1 per cent. solution of mercurochrome is said to have effected a cure.

Journal of Comparative Neurology, Philadelphia

39: 1-171 (Aug.) 1925

Studies of Pineal Body. I. Postnatal Growth of Pineal Body of Albino Rat. Y. Izawa, Philadelphia.—p. 1.
Development of Neural Folds and Cranial Ganglia of the Rat. H. B. Adelmann, Ithaca, N. Y.—p. 19.

Journal of Experimental Medicine, Baltimore

42: 123-274 (Aug.) 1925

Antigens of Red Blood Corpuscles. K. Landsteiner and J. van der Scheer, New York.—p. 123.
Lipoids as Growth-Inhibiting Factor in Serum. L. E. Baker and A. Carrel, New York.—p. 143.
*Effect of Prepuberty Castration on Subsequent Cancer Implantation. J. B. Murphy and E. Sturm, New York.—p. 155.
Effects of Obscure Lesions on Organ Weights of Apparently Normal Rabbits. W. H. Brown, L. Pearce and C. M. Van Allen, New York.—p. 163.
*Influence of Autonomic Nervous System on Function of Thyroid. J. H. Crawford and J. N. J. Hartley, Edinburgh, Scotland.—p. 179.
*Histologic Changes in Thyroid of Rabbit Following Lobectomy. J. H. Crawford and J. N. J. Hartley, Edinburg, Scotland.—p. 193.
*Function of Macrophages in Local Resistance to Bacterial Infections. W. Nakahara, New York.—p. 201.
*Experimental Study of Relation of Ovary to Fat Metabolism. M. T. Burrows and C. G. Johnston, St. Louis.—p. 215.
*Relation of Vitamins to Reaction Induced by Coal Tar in Tissues of Animals. L. H. Jorstad, St. Louis.—p. 221.
Etiology of Heartwater (Hydropericardium). I. Observation of Rickettsia, Rickettsia Ruminantium (N. Sp.), in Tissues of Animals. E. V. Cowdry, New York.—p. 231.
Id. II. Rickettsia Ruminantium (N. Sp.), in Tissues of Ticks Transmitting Disease. E. V. Cowdry, New York.—p. 253.

Effect of Castration on Cancer Implantation.—Murphy and Sturm found that male and female mice castrated during the first seven weeks of life and implanted with cancer at later periods show a resistance definitely higher than do intact animals of the same age. This increased refractiveness is evident at three months after the operation but is more pronounced at from eight months to a year. Even castration in early adult life seems to increase the refractory state to later cancer inoculation. On the other hand, adult mice inoculated within a week after castration show slight, if any, evidence of increased resistance.

Influence of Nervous System on Function of Thyroid.—Crawford and Hartley assert that there is a marked indi-

vidual variation in the histologic structure of the thyroid of rabbits examined at the same season under standard conditions. Although the microscopic appearance varies in different rabbits, the structure of the two lobes in the same animal does not differ. The variations are seen principally in the size and shape of the vesicles and in the quantity and character of the colloid. With one lobe as a control no histologic changes in the other lobe had been observed following section or stimulation of either the cervical sympathetic or the vagus and its branches.

Histologic Changes in Thyroid Following Lobectomy.—The changes which took place in the histology of the left lobe of the thyroid after excision of the right lobe have been studied by Crawford and Hartley at varied intervals of time. Two days after the removal of one lobe the other lobe showed a slightly increased colloid content, an increased vacuolation of the colloid, and a slight increase in the size of the epithelial cells. At the end of a week, the vesicles were greatly increased in size, distended with colloid, and the epithelial cells were flattened, while after three or four months signs of compensatory hypertrophy were present. The changes observed were uninfluenced by division of the vagus or cervical sympathetic.

Function of Macrophages in Resistance to Infection.—Nakahara demonstrates the ability of macrophages to dispose of pathogenic bacteria with but slight, if any, cooperation of polymorphonuclear elements.

Relation of Ovary to Fat Metabolism.—Burrows and Johnston are convinced that the follicular fluid of the ovary contains an active growth-stimulating substance and one capable of initiating an active digestion of a foreign fat, which might otherwise remain unabsorbed for an indefinite time in the tissues of these animals. Whether this substance exciting growth and a digestion of the oil is the same or in any way related to the substance exciting estrus in these animals was not determined. That it may be a different substance from the estrus-exciting substance is suggested, however, by the fact that a similar excitant of growth and fat digestion has recently been extracted by the same method from the corpus luteum of pigs. These extracts of corpora lutea have not excited estrus in spayed rats.

Relation of Vitamins to Tissue Reaction to Injury.—Jorstad has studied the tissue changes produced by coal tar. Drops of coal tar introduced into the subcutaneous tissue attract the fibroblasts, endothelial and other cells to them. These cells suffer degenerative changes through this action of the tar and the animal suffers cachectic-like changes and death from large doses of it introduced into the subcutaneous tissue. This action of the coal tar is limited to a short period of time, after which it becomes inert. The cells which have been drawn to it and which have not completely degenerated then slowly recover. Where large numbers of these cells are drawn to the tar, they grow and divide after recovering from the initial effects of the tar. Cancer may develop. Where only a few cells are drawn to the tar they lay down intercellular fibrils and a scar eventually develops. Vitamin A, fed in more than ample quantities to these animals, protects the animals and the cells against the toxic action of the tar and stimulates and prolongs their secondary growth. Vitamin B stimulates the secondary growth of these cells. This action is limited in extent and time. It is followed by an early degeneration and hyalinization of the tissue.

Journal of Metabolic Research, Morristown, N. J.

5: 1-143 (Jan., Feb., March) 1924

Preface to Karl Petrén's "Diabetes-Studier." B. Naunyn.—p. 1.
Studies on Diabetes. Karl Petrén, G. Blix, H. Malmros, M. Odin and E. Person, Lund, Sweden.—p. 7.
Influence of Insulin on Carbohydrate Content of Blood and Tissues. P. J. Cammidge and H. A. H. Howard, London.—p. 83.
Influence of Insulin on Activity of Diastatic Ferment of Liver. P. J. Cammidge and H. A. H. Howard, London.—p. 95.
*Diabetic Coma Complicated by Tuberculous Pneumothorax. E. G. Waters, Jersey City, N. J., and M. H. Ruby, Bridgeport, Conn.—p. 108.
Nutritional Requirements for Normal Reproduction. G. A. Hogan and H. M. Harshaw.—p. 111.
*Metabolic Observations in Psychiatric Cases. J. W. Sherrill, Morristown, N. J.—p. 129.

Diabetic Coma Complicated by Tuberculous Pneumothorax.—Some unusual clinical features of the case reported by Waters and Ruby are the recent occurrence of pneumothorax as a probable factor in precipitating coma, and the rapid recovery from the pneumothorax under diabetic treatment. The favorable progress of the tuberculosis under insulin treatment is similar to that already reported by a number of authors. As far as is known, the dosage of 450 units of insulin is among the highest that has ever been given in twenty-four hours to any patient who has recovered. The recovery of tolerance in such a case, to a point at which an adequate diet could be assimilated without need for insulin, is also noteworthy.

Metabolism in Psychiatric Cases.—The results obtained by Sherrill as regards suspected primary or secondary metabolic disorders in psychiatric cases and the therapeutic influence of various diets may be summed up under the following three heads: (1) Carbohydrate metabolism.—Blood sugar analyses and glucose tolerance tests in the miscellaneous forms of insanity gave results not specially different from those to be found in sane persons. No disturbance of carbohydrate metabolism was demonstrable as specifically connected with any form of nervous disease. (2) Chlorid metabolism.—The figures for plasma chlorids in the various types of insanity were similar to those found in normal persons or in other classes of patients. Strict chlorid free diets continued from fourteen to seventy-nine days gave no therapeutic benefits in dementia praecox, manic-depressive insanity, involutional melancholia, or epilepsy. (3) Fasting for epilepsy.—Four epileptics were subjected to complete fasting for two weeks. The seizures appeared to be diminished during the fast in most of the cases (though apparently aggravated in one case). No real therapeutic benefit resulted. In general, therefore, the chemical and dietetic methods here used have thrown no light upon the etiology, nature, diagnosis or treatment of nervous and mental disorders.

Kansas Medical Society Journal, Topeka

25: 245-282 (Aug.) 1925

Roentgen-Ray and Surgical Treatment of Goiter. E. P. Sloan, Bloomington, Ill.—p. 245.
Use of Skin Tests in Medicine. N. P. Sherwood, Lawrence.—p. 249.
Tryparsamide in Treatment of Neurosyphilis. W. C. Menninger, Topeka.—p. 254.
Convalescent Serum in Prophylaxis of Mumps. H. L. Dwyer, Kansas City.—p. 254.

Laryngoscope, St. Louis

35: 579-655 (Aug.) 1925

Labyrinthine Surgery. E. B. Dench, New York.—p. 579.
Gastro-Intestinal Disturbances in Infants, Result of Obscure Infection in Mastoid. A. M. Alden and H. W. Lyman, St. Louis.—p. 586.
Nature of Nutritional Disturbances. M. Marriott, St. Louis.—p. 592.
Chronic Suppurative Otitis Media. G. E. Shambaugh, Chicago.—p. 593.
Hematoma of Antrum. M. Ross, New York.—p. 600.
Bacterial Constants of Upper Respiratory Tract. S. J. Pearlman, Chicago.—p. 602.
Laryngeal Cancer; Treatment; Total Laryngectomy. F. O. Lewis, Philadelphia.—p. 607.
Foot Valve for Suction Apparatus. Device to Increase Its Efficiency. L. M. Hurd, New York.—p. 610.
Spontaneous Nystagmus, Vestibular and Functional Hearing Test Findings as Aids in Differential Diagnosis of Inner Ear and Eighth Nerve Affections. G. W. MacKenzie, Philadelphia.—p. 611.
Bronchial Flexible Aspirator. W. F. Moore, Philadelphia.—p. 623.

Maine Medical Association Journal, Augusta

16: 137-156 (Aug.) 1925

Public Status of Our Profession. F. W. Mann, Houlton.—p. 137.

Occupational Therapy and Rehabilitation, Baltimore

4: 235-310 (Aug.) 1925

Habit Retaining for Mental Patients. W. G. Ryon, New York.—p. 235.
Occupational Therapy for Chronic Arthritis Patients. M. Taylor, Boston.—p. 241.
Importance of Occupational Therapy. S. W. Hamilton, Philadelphia.—p. 245.
Progressive Rehabilitation of Handicapped. M. E. P. Lowney, Boston.—p. 253.
Occupational Worker and Trained Nurse. E. D. Bond, Philadelphia.—p. 261.
Occupational Therapy with Tubercular Patients. B. E. Lindberg.—p. 265.
Occupational Aide of Future. H. J. Hall.—p. 271.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

9: 385-432 (Aug.) 1925

Cavernous Optic Atrophy and Its Relation to Glaucoma. R. Pickard.—p. 385.
Derangements of Organo-Vegetative Nervous System and of Endocrinian System in Essential Glaucoma. H. Lagrange.—p. 398.

British Medical Journal, London

2: 279-316 (Aug. 15) 1925

Malignant Disease of Pelvic Organs. B. P. Watson.—p. 279.
Surgical Treatment of Pelvic Organs. II. V. Bonney.—p. 281.
Malignant Disease of Ovaries and Fallopian Tubes. III. S. J. Cameron.—p. 285.
*Two Cases of Tuberculous Splenomegaly. E. R. Carling and J. A. B. Hicks.—p. 291.
Difficulties in Diagnosis of Cerebellar Abscess. R. S. Stevenson.—p. 292.
*Vaccine Treatment of Splenomegaly in Chronic Malaria. R. E. Ingram-Johnson.—p. 293.
Poisoning by Ivy. P. H. J. Turton.—p. 294.
Transient Glycosuria Following Scorpion Sting. H. E. King Fretz.—p. 294.

Tuberculous Splenomegaly.—One of these patients was aged 65. There was but a five weeks' history of progressive wasting and muscular weakness, with no particular complaint or symptoms other than those due to the presence of the splenic tumor. She had noticed for two or three years that her abdomen was getting bigger. The tumor filled the whole left upper and lower quadrants and the right lower quadrant of the abdomen. The right side of the tumor, on which the notch was recognizable, was somewhat mobile, while the left side of it seemed to be deeply anchored. Splenectomy was performed. The woman died on the fourth day. The only evidence of tuberculosis was found in the spleen. The second patient was only 28. Her symptoms were of six months' duration. The spleen, firm and apparently smooth to the touch, occupied the whole left side of the abdomen, to 3 or 3½ inches below the umbilicus. Splenectomy was performed. For some weeks after discharge the patient picked up nicely, but she died six months later of generalized tuberculosis. In considering these two spleens, Carling and Hicks found that they had certain characteristic features in common, but presented certain well marked differences. A feature common to both was vascularity, with a change of the ordinary splenic structure into that of a moderately loose-meshed sponge, of which the interstices were for the most part filled with blood. Another similarity was a general increase in the interstitial fibrous connective tissue. In both spleens, some typical "giant cell" formations were found. From a surgical point of view the conclusion to be drawn from a study of these cases is that splenectomy should be performed early, and that irregular fever with splenomegaly should suggest tuberculosis.

Use of Blood Serum of Dengue Patients in Treatment of Splenomegaly in Chronic Malaria.—Being fully convinced that some antitoxin is formed in the blood of persons who have suffered from true dengue fever, which has a destructive action on the malaria parasite, Ingram-Johnson obtained a serum from the blood of persons just recovered from true dengue and experimented with it by intramuscular injection on children with chronic splenomegaly. In three cases cited the spleen receded to normal size. Ingram-Johnson suggested that by injections of this vaccine, artificial immunity from malaria can be procured. The vaccine having such an effect on malaria parasites present in the circulation (even though not causing acute attacks of malaria) should, by its presence in the blood, prevent the proliferation of parasites injected into the blood as sporozoites by infected anopheles and hence should act as a prophylactic against the disease.

Edinburgh Medical Journal

32: 389-440 (Aug.) 1925

Dr. Samuel Johnson and Medicine. R. Hutchison.—p. 389.
Maldevelopment of Wrist and Hand. L. Rogers.—p. 407.
Spontaneous Arteriovenous Aneurysm in Thorax. T. Shennan.—p. 410.
Erythredema. J. S. Fowler. Transactions of Medico-Chirurgical Society of Edinburgh.—p. 177.
Problems in Bacteriology of Puerperal Sepsis. J. Eeles. Transactions of the Edinburgh Obstetrical Society.—p. 115.

Journal of Laryngology and Otology, Edinburgh

40: 493-560 (Aug.) 1925

Function of Vestibular Organ and Clinical Examination of Otolithic Apparatus. III. Past Pointing Test. F. H. Quix.—p. 493.
Otosclerosis: Does It Exist as Separate Disease? R. Lake.—p. 512.
Septic Tonsillitis Followed by Bilateral Acute Middle Ear Suppuration; Acute Mastoiditis, Acute Nephritis, Hemorrhage from Bowel and Secondary Anemia. Recovery. E. D. D. Dickson.—p. 530.
Abductor Paralysis of Right Vocal Cord Subsequent to Scirrhus Cancer of Left Mamma. A. L. Turner.—p. 534.
New Audiometry. G. Wilkinson.—p. 538.

Glasgow Medical Journal

104: 65-120 (Aug.) 1925

Delirium Associated with Physical Signs of Exophthalmic Goiter. I. S. Skottoer.—p. 65.

Journal of Mental Science, London

71: 353-630 (July) 1925

Mind and Brain. J. S. Bolton.—p. 357.
Vasomotor Reactions in Mental Disorders; Hemoclastic Crisis. I. D. Robertson.—p. 386.
Interpretation of Some Sexual Offenses. W. N. East.—p. 410.
Malarial Treatment of General Paralysis. N. B. Graham.—p. 424.
Sensitivity of Sympathetic Nervous System to Adrenalin in Some Cases of Mental Disorder. W. McWilliam.—p. 432.
Value of Simple Laboratory Tests in Diagnosis of Neurosyphilis Compared with Wassermann Reaction. S. Grossman.—p. 439.
Blood-Sugar Studies in Mental Disorders. S. A. Mann.—p. 443.
*Investigation of Cases of Early Mental Disorder by Levulose Test for Liver Glycogenic Efficiency. S. A. Mann.—p. 474.
Hemoclastic Crisis in Early Mental Cases. A. A. W. Petrie.—p. 482.
Treatment of General Paralysis by Malaria. T. W. Davidson.—p. 486.

Levulose Test for Liver Efficiency in Mental Cases.—A summary of the results obtained at the Belfast Mental Hospital last year shows that out of fifty-five unselected cases of general paralysis in all stages of the disease, 36 per cent. were considerably improved and suitable for discharge. All these cases showed marked psychic improvement, but this improvement was not accompanied by a parallel one in the physical signs. Serologically the improvement was less obvious. Apoplectiform seizures following the treatment were conspicuous by their absence. Complications are negligible and fatalities due to the treatment average not more than 10 per cent.—a percentage somewhat higher than the average of other workers. Graham says that malarial treatment is the more beneficial the earlier it is instituted in the course of the disease, and that it undoubtedly offers the best prospects of any treatment so far available of brightening the outlook in cases of general paralysis of the insane.

Journal of Obstetrics and Gynaecology of the British Empire, London

32: 201-432 (Summer) 1925

*Report on Prognosis and Treatment of Puerperal Sepsis.—pp. 201, 223.
*Premature Separation of Normally Implanted Placenta. J. W. Williams.—p. 259.
*Inversion of Uterus. W. McK. H. McCullagh.—p. 280.
*Puerperal Fever in Rotunda Hospital, Dublin. G. FitzGibbon and J. W. Bigger.—p. 298.
*Etiology of Puerperal Sepsis. J. W. Bigger and G. FitzGibbon.—p. 318.
*Subperitoneal Gilliam Operation. B. Solomons.—p. 330.
Absence of Vagina with Hematometra, Hematosalpinx and Tarry Cysts; Case. W. E. Fothergill.—p. 336.
Primary Ovarian Pregnancy; Case. J. M. Gilmor, E. C. Smith and J. B. Gatenby.—p. 339.
Case of Endometriomyoma of Posterior Uterine Wall. F. Ivens.—p. 344.

Puerperal Sepsis.—This report is based on analyses of 249 cases, with recovery in 160 and death in eighty-nine. The analysis made of these cases suggests that the following should be considered to be of grave significance: (1) Onset of pyrexia during labor or within twenty-four hours of its termination. (2) Extensive tissue damage in the labor, particularly tearing of vagina and cervix rather than of perineum only. (3) Presence of streptococci in the blood. (4) Persistently high pulse rate. (5) Insomnia. (6) Diarrhea with or without general peritonitis. (7) General peritonitis, pneumonia, or delirium. Signs and symptoms of good prognostic significance are: (1) Absence of streptococci in the blood. (2) Moderately low pulse rate, about 120. (3) Freedom from insomnia and diarrhea.

Premature Separation of Normally Implanted Placenta.—Williams reports a fatal case of separation of the normally implanted placenta with concealed hemorrhage, in which the amount of blood lost was insufficient to account for the symptoms of shock, and in which necropsy failed to show the existence of toxemic lesions. The natural history of the accident in a series of forty cases is considered, and details are given of a patient who suffered from it in two successive pregnancies. Antepartum hemorrhage is almost as frequently associated with premature separation as with placenta praevia, fifty-seven and sixty-four cases, respectively, of the two conditions having been noted in 9,000 consecutive admissions. The prognosis is serious for the mother and alarming for the child, the mortality being 7.5 and 75.5 per cent., respectively. Most severe cases are associated with the uteroplacental apoplexy of Couvelaire, but not always. In many of the severe cases, preeclamptic toxemia, eclampsia, chronic nephritis or "essential hypertension" precede or accompany the accident. But in fifteen of the thirty-seven patients who survived delivery, albuminuria was entirely absent during the puerperium. If many of the severe cases are the result of a toxemia, Williams says, it must be admitted that its origin and mode of action are unknown. Evidence is adduced to show that traumatism, syphilis, inflammation of the decidua, shortness of the umbilical cord, and torsion of the pregnant uterus are rarely, if ever, concerned in the production of the accident. Ligneous consistence of the uterus was observed in about every third case. When present it is a pathognomonic sign, but its absence does not accord equally valuable negative evidence.

Inversion of Uterus.—McCullagh reports on three cases and gives the results of an analysis of 233 recently recorded cases, of which number 200 were associated with labor and thirty-three were due to tumor, i. e., 85 per cent. were puerperal.

Acute Puerperal Fever.—Among the fifty-seven cases of acute puerperal fever reviewed by FitzGibbon and Bigger in this paper, there were twenty-nine deaths, or 51 per cent. During the four years from which these infected cases were collected, there were 14,380 confinements attended, and of these forty appear as acute puerperal sepsis with sixteen deaths; this gives an incidence of infection of 2.8 per thousand and a mortality of 1.1 per thousand.

Etiology of Puerperal Sepsis.—Streptococci were found by Bigger and FitzGibbon in the vagina before and after delivery in 68 per cent. of the cases examined. Hemolytic streptococci were only found twice in the examination of 108 vaginal swabs. *Streptococcus pyogenes* was never found. The predominant nonhemolytic streptococci of the vagina were *S. fecalis* and *S. mitis.* Nonhemolytic streptococci were present in the postpartum uterus in at least 20 per cent. of the cases examined. The authors suggest that the commonest form of puerperal sepsis, that caused by hemolytic streptococci (and particularly *Streptococcus pyogenes)* is due to exogenous infection. Nonhemolytic streptococci occasionally cause puerperal sepsis.

Results from Gilliam Operation.—Solomons asserts that properly performed subperitoneal operation will cure the symptoms in nearly all cases of backward displacement of the uterus, whether mobile or fixed. There will be no postoperative complications nor trouble in labor. Furthermore, there can be no comparison between a subperitoneal shortening of the ligaments, and either an intraperitoneal shortening or any direct uterine suspension. The first is safe; the two last styles are fraught with dangerous possibilities.

Journal of State Medicine, London

33: 351-400 (Aug.) 1925

Progress in Military Hygiene. W. B. Leishman.—p. 351.
Industrial Hygiene. M. Muspratt.—p. 355.
Tropical Diseases. A. Balfour.—p. 360.
Pathology, Bacteriology and Bio-Chemistry; High Energy Chemistry and Vitamins. E. C. C. Baly.—p. 368.
Women and the Public Health. M. Hardy.—p. 377.
Relation of Filterable Viruses to Public Health. J. E. McCartney.—p. 378.
Sterilized Milk and Its Relation to Public Health. R. W. Lane.—p. 384.

Journal of Tropical Medicine and Hygiene, London

28: 277-296 (Aug. 1) 1925

*Studies of Yellow Fever Epidemic in Salvador, C. A., in 1924. H. R. Muller and C. B. Blaisdell.—p. 277.
Experimental Use of Fish Indigenous to British Guiana for Control of Mosquitoes Breeding in Vats, Tanks, Barrels and Other Water Containers. J. F. C. Haslam.—p. 284.

Yellow Fever Epidemic in Salvador.—Among nineteen persons who had recovered from clinically positive yellow fever in San Salvador, in 1924, in sixteen (84 per cent.) the serum gave a positive Pfeiffer test. Of five persons from the western part of the republic, who had passed through a disease which was clinically suspicious of yellow fever, the serum of two gave positive reactions. The tentative diagnosis of yellow fever in these two cases was thus confirmed by the Pfeiffer test. The serum of fifteen soldiers who had lived in San Salvador and in the same barracks where yellow fever had occurred gave negative reactions. Fifteen normal sanitary inspectors who had no history of yellow fever gave negative Pfeiffer reactions, while the test was positive in the case of one inspector who had had yellow fever in Peru four years previously. Twenty-two children, from 6 to 8 years of age, who had lived in San Salvador during the epidemic, all gave negative Pfeiffer reactions. Pfeiffer tests of the serum of vaccinated but otherwise normal persons showed that in some instances the lytic substances induced by vaccination may still be active against *Leptospira icteroides* after a lapse of five months. The pathologic findings in six cases of yellow fever are presented by Muller and Blaisdell. In the liver, zonal necrosis was present, and, more rarely, focal necrosis, together with marked fatty degeneration. Associated with these changes was a round cell infiltration and a milder polymorphonuclear infiltration. Mitosis and hemorrhages were frequently found. In the kidney there was evidence of acute tubular nephritis of varying intensity. Lime casts were present in two of the six cases. Their appearance suggested that they originated from desquamated epithelial cells which had become calcified. The suggestion is offered that lime casts are found in some but not all types of nephritis associated with yellow fever, occurring especially when desquamation is a feature.

Kenya Medical Journal, Nairobi, East Africa

2: 95-124 (July) 1925

Biology of Sleeping Sickness. G. D. H. Carpenter.—p. 96.
Rand Scurvy. J. L. Gilks.—p. 104.
Case of Hypernephroma. J. O. Beven.—p. 120.
Surgical Cases Seen in Native Hospital at Nairobi. C. V. Braimbridge.—p. 121.

Lancet, London

2: 415-480 (Aug. 29) 1925

Student's Number. Session 1925-1926.—pp. 415-458.

Medical Journal of South Africa, Johannesburg

20: 347-378 (July) 1925

Pyelography in Renal Disease. E. B. Fuller.—p. 348.
*Anemone Transvaalensis. M. G. Brandwyk and J. M. Watt.—p. 357.
Sterility in Women. G. Lange. II.—p. 360. Conc'n.
Law and the Doctor in South Africa. H. de Villiers. IV.—p. 366. Cont'd.

Anemone Transvaalensis.—The natives of the Helspruit district, and also Europeans, use this wild plant to relieve headache by crushing some fresh leaves in the hand and inhaling the vapor. A decoction, made by boiling the leaves and roots in water, is used as a lotion to wash festering wounds and to relieve poisonous bites. Brandwyk and Watt report on its pharmacology. The leaves of *Anemone transvaalensis,* when fresh, are irritating and produce blistering on the skin. This action is due to the presence of anemonol, which readily decomposes into anemonin and iso-anemonic acid, both of which are nonirritating. Its local action is too drastic, too penetrating and too slow for use in medicine, and is inferior to that of cantharis. The irritating properties of the plant are quickly and easily lost on drying. Chemically and pharmacologically, *Anemone transvaalensis* resembles very closely other irritating *Ranunculacae.* The use of a decoction seems illogical, as it is nonirritating and contains neither tannic acid nor alkaloids which might exert a local action.

Annales de l'Institut Pasteur, Paris

39: 641-716 (Aug.) 1925

*Vaccination of Monkeys Against Tuberculosis. J. Wilbert.—p. 641.
*Experimental Putrefaction. M. Weinberg and B. Ginsbourg.—p. 652.
Serum and Vaccine Therapy of Keratitis. Chaillous and Cotoni.—p. 685.
Physiologic Import of Iron and Zinc. Bertrand and Nakamura.—p. 698.
Physiologic Mutation in Mice. G. Bertrand and H. Nakamura.—p. 708.
Disease Resembling Typhoid in Rats. I. Gheorghiu.—p. 712.

Vaccination of Monkeys Against Tuberculosis.—Wilbert's article was reviewed editorially September 12, page 826.

Experimental Putrid Infection; Causal Factors and Therapy.—Weinberg and Ginsbourg's experiments consisted in inducing lesions of putrefaction in guinea-pigs. The process appears to be due to histolysis by bacilli, accompanied with formation of fetid substances. The principal proteolytic bacillus involved is *B. sporogenes.* The bacilli are associated with one or several toxic, nonproteolytic bacilli. An essential putrid infection is rare; frequently it complicates an acute or chronic infection of different nature. Usually several tissues are affected; sometimes the lesions are chiefly located in muscle or exclusively in skin and the subcutaneous cellular tissue. The lesions of the tissues may not be extensive, even when the fetidity is very pronounced; this occurs in putrid peritonitis or pleuritis. Grave lesions from putrefaction-inducing bacilli disappear spontaneously, if the bacilli are only slightly pathogenic. The authors assert that putrid infection is easily controlled by intravenous injections of specific serums against all the bacilli involved or, at least, against the predominant bacillus. The injection should precede an operation for removal of a gangrenous appendix, or gangrenous focus in the lung. Postsurgical complications may be avoided with the preliminary serotherapy.

Annales des Maladies Vénériennes, Paris

20: 481-560 (July) 1925

Syphilitic Jaundice. F. Sarateanu and M. Blumental.—p. 481.
Measures Against Syphilis in Russia. S. Bagotzky.—p. 489.
Tonic Action of Bismuth. G. Belgodère.—p. 504.
*Congenital Syphilis and Pregnancy. Récamier.—p. 515.

Congenital Syphilis Roused by Pregnancy.—Récamier treated four women, aged from 20 to 28 years, who first presented signs of syphilitic infection after the birth of the first baby. None of the women had an abortion, and the infants were normal. Investigation revealed that the fathers of the four women had a history of syphilis. The pregnancy seemed to have awakened the latent congenital syphilis. The efficiency of the specific treatment confirmed the diagnosis.

Archives des Maladies de l'App. Digestif, Paris

15: 513-630 (June) 1925

Clinical Estimation of the Metabolism. M. Labbé.—p. 513.
Insulin and Intermediate Carbohydrate Metabolism. J. A. Collazo.—p. 532.
*Albumin in Duodenal Juice. D. Simici and A. Téodoru.—p. 554.
Intestinal Actinomycosis. C. Cornioley and R. Hoffmann.—p. 576.
Tumors in Gastric Neurilemma (Schwannomas). Oettinger et al.—p. 592.
Entire Large Colon in Left Side. M. P. Weil and G. Détré.—p. 602.
*Nontabetic Gastric Crises. L. M. Lamy.—p. 605.
Lamblia in the Gallbladder; Three Cases. Labbé and Nepveux.—p. 609.

Diagnostic Value of Albumin in Duodenal Juice.—No albumin was found in the duodenal juice of eight healthy persons, examined by Simici and Téodoru. In seventeen cases of catarrhal jaundice, albumin was constantly present in the duodenal juice. The amount of albumin was larger in the beginning of the disease than at the end, but it persisted during convalescence, after other symptoms had disappeared. Albumin was found in the duodenal juice of five patients with jaundice from arsphenamin treatment; in three cases of angiocholitis; in two of hypertrophic cirrhosis of the liver, and in two of grave anemia—all associated with jaundice. Albumin was noted also in two patients with chronic constipation and in one with a tenia, without jaundice. Changes in the liver cell and its membrane are probably responsible for the passage of albumin. In catarrhal jaundice, the lesion of the hepatic cell is more important than the inflammation of the biliary ducts, since the increase of albumin is not accompanied by increase of mucin. Examination of duodenal juice for albumin may reveal a slight deficiency of the liver cell, clinically masked.

False Gastric Crises.—Tabes had been diagnosed in the old syphilitic, but the trouble proved to be a duodenal ulcer, cured by gastro-enterostomy.

Bulletin de l'Académie de Médecine, Paris

94: 833-853 (July 28) 1925

Measures Against Transmission of Smallpox by Imported Goods. Camus.—p. 835.
Sterilization of Coins and Bills. Hanriot et al.—p. 841.
Liver Deficiency Following Measles. F. Ladreyt.—p. 844.
Hypertrophy of the Hair System Near Site of Trauma. C. P. Caplesco.—p. 846.
Treatment of Rebellious Uterine Leukorrhea. O. Bottaro.—p. 850.

Journal de Radiologie et d'Electrologie, Paris

9: 305-352 (July) 1925

*Roentgen-Ray Treatment of Lymphocytoma. J. Belot et al.—p. 305.
Roentgen-Ray Diagnosis of Disease in the Large Intestine. R. Ledoux-Lebard.—p. 316.
Roentgen Rays of Moderate Penetrating Force. J. Belot.—p. 321.
Treatment of Epidemic Poliomyelitis. Delherm and Laquerrière.—p. 329.

Action of Roentgen Ray on Cancer of Lymphocytoma Type.—Belot and his co-workers treated, during the course of a year, a tuberculous woman, aged 47, with fifty-eight tumors of this type, the size ranging from that of a nut to a large fist. They exposed each tumor in turn, and each became reduced in size by a third in eighteen hours after exposure to from 8 to 10 roentgen units, and had clinically disappeared by the fourth day. No toxic phenomena were noted, although two or three tumors were treated each week. A lymphocytoma which developed in the orbit two years later was also exposed to 10 roentgen units, and the tumor and secondary exophthalmos subsided in five days. In one of several other lymphocytoma cases a tumor of the breast disappeared under 15 units in twelve days, and tumors of the face and chest in a few days. Under exposure to 20 roentgen units a tumor in a man's axilla disappeared in five days, and one in the thyroid region in eight days. This patient died six months later, probably from a deep tumor in the thorax. Obviously the prognosis of the disease is still grave, since recurrences and metastases are frequent. The serial microscopic findings in the first case confirmed the destruction of the cancer cells by the rays, the intense diapedesis of macrophages, and the intense phagocytosis.

Marseille Médical

62: 945-988 (June 5) 1925

*Autoserotherapy in Epidemic Encephalitis. D. Paulian.—p. 945.
Heart of Double Monsters. F. Corsy.—p. 956.

Intraspinal Injections of Autoserum in Treatment of Epidemic Encephalitis.—Paulian applied this method in acute encephalitis and in over thirty patients with postencephalitic parkinsonism. From 40 to 50 c.c. of blood were withdrawn, and the serum inactivated at 56 C. A dose of 10 or 15 c.c. was injected intraspinally, after an equal amount of cerebrospinal fluid had been removed. The patient then reclined (without pillow) for twenty-four hours. In two cases, among others, of acute encephalitis in young girls, a single injection was followed by improvement the next day, and complete recovery of one patient the fifth day. In cases of postencephalitic sequelae from one to six injections were required; sometimes the injections were resumed after three months, and then given daily for three months. Change in the attitude and facial expression, and reappearance of the automatic movements of the arms, in walking, were noted after the first injection. The recovery has persisted in eight patients for several months to date; in others a considerable amelioration was manifest. In several cases intravenous injections of 5 c.c. of a 25 per cent. solution of sodium salicylate were given supplementary to the intraspinal autoserotherapy. He queries whether the autoserum induces an intensive reaction in the nervous centers and a certain immunity, or whether the serum contains specific antibodies against the disease.

Presse Médicale, Paris

33: 1105-1120 (Aug. 19) 1925

Tabetic and Cerebellar Ataxia. L. Bard.—p. 1105.
Access to Posterior Hydatid Cysts of the Liver. Costantini.—p. 1107.
Mechanism of Mountain Sickness. L. Binet.—p. 1109.

33: 1121-1136 (Aug. 22) 1925

Tuberculosis and Nocardiosis. H. Gougerot.—p. 1121.
*Hemotherapy in Psychoses. Pascal and Davesne.—p. 1126.

Hemotherapy in Mental Disorders.—Pascal and Davesne treated by injections of whole blood three patients with a grave form of dementia praecox and three with an acute form of hebephrenia and catatonia. The blood was taken from insane patients during a period of remission induced by hemotherapy, nuclein or turpentine shock. In five instances the blood groups corresponded with those of the patients. Six intramuscular injections, each of 20 c.c. of blood, were given at two day intervals, before meals. Sometimes 5 or 10 c.c. were given in the first injection, 15 or 20 c.c. in the next. No complications were noted with the treatment. Two patients recovered; in three the psychosis temporarily improved. In one case the result was negative. This blood injection treatment may be indicated for the insane with insufficient nourishment and poor general condition; also in women with irregular menses. It seems to be the treatment of choice in different forms of melancholia, and in compensating the mineral deficiency in maniacal conditions.

Revue Médicale de la Suisse Romande, Geneva

45: 545-608 (July 25) 1925

Calculi in Urinary Passages. H. Curchod.—p. 545.
Appendicitis in Child with Acetonemic Periodical Vomiting. J. Roux and R. Masson.—p. 551.
*Sedimentation Test in Tuberculosis. Willy Racine.—p. 556.
*Peritonitis from Pancreatitis. L. Choquard.—p. 590.

Sedimentation Test in Pulmonary Tuberculosis.—Racine's 406 monthly tests on 106 subjects at Leysin confirmed that regularly accelerated speed is an unfavorable omen. The extent of the pathologic process and the progressing character of the lesion determine the state of the balance between the forces of molecular attraction and of electric repulsion of the erythrocytes.

Acute Pancreatitis.—Transudation through the apparently intact walls of the pseudocyst was responsible for the diffuse peritonitis in the multipara, aged 29. She recovered after drainage of the cavity and clearing 200 cholesterol calculi out of the gallbladder.

Schweizerische medizinische Wochenschrift, Basel

55: 749-776 (Aug. 13) 1925

An Introduction to Climatology. G. Michel.—p. 749.
Effects of High Altitude. A. Loewy.—p. 750.
The Nucleal Blood Reaction. A. Kamsler.—p. 751.
Recent Research on the Vegetative Nerve System. A. Kamsler.—p. 752.
Metabolism Under Reduced Atmospheric Pressure. W. Laubender.—p. 754.
*Idem. A. Jaquet.—p. 755.
Treatment of Large Tuberculous Cavities. G. Rossel.—p. 760.
Blood Proteins in Diagnosis of Tuberculous Activity. E. Brieger.—p. 763.
On Medical History in Japan. Gigon.—p. 771.

55: 777-796 (Aug. 20) 1925

Leukocytosis in Appendicitis. A. Fonio.—p. 777.
Serodiagnosis of Tuberculosis. H. Würz.—p. 783.
A Case of Ovarian Cancer in Full Term Pregnancy. R. L. Rochat.—p. 787.
Physicians and the Legislation on Alcohol. A. Koller.—p. 788.

Metabolism Under Reduced Atmospheric Pressure.—Ehrlich presented convincing experimental evidence for the theory that arsenic compounds are toxic for the animal organism only when the arsenic is in the trivalent state. On the basis of this theory, Jaquet took the minimal lethal dose of pentavalent arsenicals (atoxyl and sodium cacodylate) as a means to measure the reduction processes in the rabbit under various atmospheric pressures. He found that under a pressure which is equal to an altitude of 1,800 meters, the lethal dose of these arsenicals is reduced by 22-23 per cent. as compared to the lethal dose under 760 mm. pressure. This demonstrates that even at an altitude which usually does not produce any subjective symptoms, the metabolic processes are altered.

Archivio Italiano di Chirurgia, Bologna

11: 445-548 (June) 1925

*Skin Grafts. A. Bertocchi.—p. 445.
*Sequelae of Grafting. Oreste Andrei.—p. 483.
Tooth Plate in Bronchus. Benedetto Agazzi.—p. 511.
The Reticular Tissue in Repair After Wounds. F. Usuelli.—p. 517.
Cystic Epiphysitis of Femur. Francesco Virgillo.—p. 538.

Skin Grafts.—Bertocchi made sixty-five experiments on rabbits which demonstrated the advantages of using skin conserved in alcohol or other fixing agent when it is impracticable to use autografts. The graft does not heal in place like an autograft, but there is gradual reconstruction of tissue under the guidance of the flap, utilizing some of its elements.

Production of Bone or Cartilage After Ingrafting of Tissues.—Subcutaneous implantation in the rabbit or guinea-pig ear of scraps of certain living tissues or tissues treated with a fixing agent may lead to production of bone or cartilage at the point. Implantation in back or thigh was always negative, as also in dogs' ears.

Clinica Medica Italiana, Milan

56: 193-290 (June) 1925

*The Combined Sugar in Diabetes. V. Bisceglie.—p. 215.
*Syphilis of the Stomach. Luigi Ajello.—p. 227.
Experimental Lead Poisoning. Luigi Scremin.—p. 244.
*Chronic Infectious Endocarditis. A. Ceresoli.—p. 256.

The Combined Sugar in Diabetes.—Bisceglie reports experiences which confirm that the absolute and proportional amounts of the combined sugar in relation to the free sugar in the blood are doubled in diabetes. This is even more pronounced under the influence of insulin; as the free sugar drops, the relative amount of combined sugar increases. The hypoglycemia from insulin may be due in part to the transformation of the free sugar into the combined form.

Syphilis of the Stomach.—Ajello analyzes the necropsy records in the literature, classifying under seven headings the manifestations of syphilis in the stomach. A case described in detail presented a nodular sclerogummatous infiltration.

Chronic Infectious Endocarditis.—Ceresoli adds nine new cases of endocarditis lenta to the sixty already published in Italy. He confirms the etiologic importance of *Streptococcus viridans*, and the well defined clinical and histologic findings of this morbid entity.

Policlinico, Rome

32: 867-897 (June 22) 1925

*Membrane-Filtered Serums. E. Trenti.—p. 867.
Primary Cancer of Liver in Boy. C. Arrigoni.—p. 873.
Curetting the Uterus. N. Federici.—p. 876.

Biologic Reaction of Serums Filtered Through Collodion.—Trenti accepted the nonpassage of globulin through the collodion sac under pressure (60 cm. of mercury) as a reliable gage of the permeability of the sac. The filtrate of a serum that previously agglutinated typhoid bacilli and the melitensis had not a trace of agglutinating power left. The Wassermann and the Sachs-Georgi reactions were always negative in the filtered serum (twenty syphilities; ten controls), but the reaction occurred with great intensity when the residuum was diluted, even with distilled water which must have upset the colloid balance.

32: 1077-1108 (Aug. 3) 1925

Treatment of Malaria. V. Ascoli.—p. 1077.
*Gonococcus Pyelonephritis. C. F. Bianchetti.—p. 1081.
"Bacterial Calculi" in Kidney Pelvis. E. Venezian.—p. 1083.

Gonococcus Pyelonephritis.—Bianchetti's patient, a woman of 52, had had bladder disturbances for five years, recurring in spite of repeated treatment. Finally vague oppression in one kidney region led to the discovery of multiple gonococcus abscesses in this kidney. A complete and permanent cure followed clearing out the abscesses and draining.

32: 1143-1173 (Aug. 17) 1925

Spa Treatment of Cholelithiasis. G. Sabatini.—p. 1143.
*Intracardiac Injection of Epinephrin. F. Speciale.—p. 1149.
U. Biffi the Pioneer in the Sedimentation Test (1904). L. Lattes.—p. 1151.

Intracardiac Injection.—Speciale introduces the needle 2 cm. from the margin of the sternum, and perpendicularly,

grazing the upper margin of the fifth rib. In a clinical case with prompt recovery from chloroform syncope after injection of 2 mg. of epinephrin, and in ten cadavers the needle entered the left ventricle. This allows the injected drug to pass directly to the central nervous system without the delay of passing through the minor circulation first. By this means the faintest throb of the heart is utilized for action on the respiration centers, as well as on the heart itself.

32: 373-420 (Aug. 15) 1925. Surgical Section

Intramuscular Lipoma in Arm. M. Bufalini.—p. 373.
Appendix Detached and Ulcerated. L. Gobbi.—p. 381.
Primary Hydatid Cyst in Lung. U. Nobili.—p. 390.
Removal of Mixed Tumor from Youth's Kidney. G. Petta.—p. 400.
*Painful Chronic Mastitis. L. Torchiana.—p. 410.

Painful Chronic Mastitis.—After failure of other measures, the apparently sound breast was removed, and at once the severe pains subsided. They were explained by a deep diffuse inflammatory process, not neoplastic.

Riforma Medica, Naples

41: 529-552 (June 8) 1925

*Hypoglycemia from Yeast. G. Battista Orlandi.—p. 529.
Indications for Operations on Peripheral Nerves. Pisanò.—p. 532.
Botelho Reaction Not Specific for Cancer. A. Malaguti.—p. 538.

Hypoglycemia Induced by Yeast.—The research reported confirms the lowering of the sugar content of the blood in rabbits under the influence of an extract of yeast or of living yeast fungi. This action has nothing to do with direct ferment action on sugar.

41: 697-720 (July 27) 1925

*Pneumothorax Treatment of Bronchitis. A. De Martini.—p. 697.
*Early Syphilitic Meningitis. Guido Milani.—p. 701.
*Malaria. M. Battaglia.—p. 705.
*Colloidal Extracts of Tubercle Bacilli. A. Grimberg.—p. 706.

Bilateral Pneumothorax in Treatment of Chronic Catarrhal Bronchitis.—De Martini reasons that an artificial pneumothorax would tend to immobilize the inflamed walls of the bronchi and give them a chance to heal. The sputum dropped from 200 to 60 c.c. in five weeks in one man. From 85 to 201 c.c. of the gas were introduced into the pleura on each side at each sitting as a rule. The intervals were from days to a week, and this pneumothorax treatment was kept up for five months, the sputum then 50 c.c.

Syphilitic Meningitis.—A recently infected young woman developed acute and severe syphilitic leptomeningitis. She recovered promptly under specific treatment except that the strabismus persisted for a few months.

Unusual Manifestations of Malaria.—Battaglia has had cases in which the absence of choked disk was the only puzzling element of a supposed brain tumor syndrome. In other cases the malaria induced intermittent psychopathies and cerebellar disturbances, the gait so altered that drunkenness was often assumed. Cases like these may develop insidiously, with little or no fever at first. Neuropathic disturbances of malarial origin are exceptionally tenacious. One of his patients presented all the symptoms of a sudden cerebral hemorrhage except that there was no conjugate deviation of the eyes. One malaria patient presented aphasia with right hemiplegia, as the fever ran high in an attack. Both in acute and in chronic malaria, changes in the walls of the vessels are common, up to diffuse arteriosclerosis. Aneurysm, on the other hand, he never found in malaria cadavers, probably because the blood pressure is generally low in malaria.

Treatment of External Tuberculosis.—Grimberg reports an additional series of 225 cases in which treatment was with his colloidal suspension of tubercle bacilli particles, triturated with iron filings in a magnetic field.

Rivista di Clinica Pediatrica, Florence

23: 505-576 (Aug.) 1925

*Epidemic Meningitis in Children. Antonio Baldazzi.—p. 505.
*Basal Metabolism in Children. Paolo Bosio.—p. 529.
Tuberculous Pericarditis with Cirrhosis of the Liver. G. Griffo.—p. 546.
Increase in Guanidin Bases in Tetany. E. Pirami.—p. 555.

Epidemic Meningitis in Children.—Baldazzi summarizes eighty-five cases. The mortality was 47.36 per cent. among the nineteen given merely symptomatic treatment, and 55:32 per cent. of sixty-five treated with antiserum.

Basal Metabolism in Infants.—Bosio's figures obtained from fifty infants are very close to Benedict and Talbot's figures, with a tendency to higher figures and greater fluctuations in the malnourished. His figures (Du Bois' height-weight formula) were always higher than those obtained by the Pirquet formula.

Anales de la Facultad de Medicina, Lima

7: 145-385, 1925

*Insanity in the Indians of Peru. H. Valdizan.—p. 145.
Probational Lectures for Chair of Anatomy. F. Quesada.—p. 165; p. 177.
Idem, Chair of Pediatrics. E. L. Garcia.—p. 189; p. 204.
*Congenital Malformation of the Female Genital Organs. Bazul.—p. 220.
History of the Lima Medical School. H. Valdizan. Supplement.—pp. 1-88.

Insanity in the Indians of Peru.—Valdizan remarks that comparatively few Indians are found in the asylums of Peru. The records of the Hospicio de Insanos at Lima, from 1859 to 1917, show only 535 Indian inmates, including 232 women. The age of the majority was between 16 and 25, and 74.27 per cent. were unmarried. The most frequent psychoses were the toxic (23.17 per cent.); manic-depressive (21.80 per cent.); epilepsy (12.85 per cent.), and idiocy (6.33 per cent.). Valdizan adds that these figures are not really dependable as the Indians often conceal the fact of their race, claiming to be white. The old writers commented on the mildness of insanity in Peru. Dementia praecox in the Indian race is characterized by delirium based on legend and the history of the country.

Congenital Malformation of the Female Genital Organs.—Nineteen cases are described. The external malformations predominated. These atresias induce hematometria, hematocolpos, etc.

Anales de la Soc. Médico-Quir. del Guayas, Guayaquil

5: 102-137 (June) 1925

*Nephelometric Method for Counting Bacteria. F. Rojas.—p. 108.
Brachial Paralysis from Cervical Ribs. Gilbert and A. Pareja Coronel.—p. 114.

Nephelometric Method for Counting Bacteria.—The method described seems to be more sensitive and nearly as exact as the Wright and the Hopkins methods. The standard solution is a 10 per cent. solution of a suspension of 175 mg. of tertiary calcic phosphate in an isotonic solution of sodium to a volume of 100 c.c. When the turbidity of the suspension of bacteria in corresponding physiologic sodium chlorid solution approximates that of the standard, the nephelometer figure (fifty million bacteria to 1 c.c.) is divided by the figure representing the suspension of bacteria, and multiplied by 50.

Medicina, Mexico City

5: 281-306 (June) 1925

*Examination of the Abdomen. E. S. Rojas.—p. 281.
Drainage After the Wertheim Operation. Martinez Parente.—p. 284.
Mechanism of Abortion. A. López Hermosa.—p. 286.
Various Forms of Ringworm. Prolongo.—p. 292. Cont'd.
*Testing for Tolerance of Carbohydrates. C. Zuckermann.—p. 300.
Skin Cancer and Radiotherapy. Felipe Sicilia.—p. 304.

Exploration of the Abdomen.—Rojas asserts that investigation of conditions in the abdomen is much facilitated by having the shoulders raised as the patient reclines, the legs in the position as for an operation on the perineum. This reduces the average space of 36 cm. between the pubis and the xiphoid process to 22 cm., and thus relaxes the muscles to the maximum.

Tolerance for Carbohydrates.—Zuckermann tabulates the findings in fifteen healthy persons on a test diet. They demonstrate, he says, that glycosuria is not a reliable index for the tolerance of glucose. The glucose content of the blood has to reach 0.17 or 0.18 per cent. before glucose appears in the urine, and there is always some delay in this. The index should regard both the quantity and the time, both the delay and the elimination per minute.

Pediatría Española, Madrid

14: 161-192 (June) 1925

*Treatment of Chorea. J. de Cardenas y Pastor.—p. 161.
Two Cases of Monosymptomatic Glomerular Nephritis, J. Gonzalez Edo. —p. 178.

Treatment of Chorea.—Keeping the child in bed is regarded as an essential element in the treatment of chorea by de Cardenas. He has found hexamethylenamin by the vein useful in epidemic encephalitis, and consequently gave it a trial in eleven cases of tenacious chorea in children, aged 6 to 12. Improvement was evident by the third injection, and one was cured with five in eleven days. In one child eighteen injections were made in six weeks, increasing from the usual dose of 2 c.c. of a 5 per cent. solution to 6 c.c. Typhoid developed a week later and proved fatal within a month. This case disproves the alleged prophylactic action of hexamethylenamin in respect to typhoid. In a more recent series of two cases of chorea he used a 10 per cent. solution with good results.

Revista de Cirugía, Buenos Aires

4: 97-144 (June) 1925

Treatment of Intestinal Occlusion. V. Pauchet.—p. 97.
Surgery of the Thyroid. R. V. Hernández.—p. 105.
Shitting the Ulnar Nerve. Alberto Gutiérrez.—p. 116.
*Arteriovenous Aneurysm at the Elbow. M. Corachan.—p. 124.
Surgical Treatment of Artificial Anus. Avelino Gutiérrez.—p. 134.
Perforation of Side-to-Side Entero-Anastomosis. E. Cornejo Saravia.—p. 137.
*Hydatid Cyst in Muscle. C. Velasco Suárez.—p. 139.
Spontaneous Rupture of Epigastric Artery. R. Donovan.—p. 142.

Arteriovenous Aneurysm at the Elbow.—The aneurysm had developed after the man had cut himself accidentally just above the bend of the elbow. Corachan did not extirpate the aneurysmal sac, but resected the artery, with an end-to-end suture. The illustrations show the technic and the apparently complete cure of all disturbances to date (four months).

Hydatid Cyst in the Abdominal Rectus Muscle.—Velasco Suárez has been able to find records of only four cases of a hydatid cyst in muscle tissue, and adds a fifth to the list. It had evidently started in the muscle but had developed inward toward the posterior sheath of the muscle, simulating an ovarian cyst.

Revista Médica del Rosario

15: 67-106 (April) 1925

Apparently Normal Pregnancy and Delivery with Cancer of the Uterine Cervix. P. Ferrazini.—p. 67.
*Trachoma in Rosario. C. Weskamp.—p. 80.
*Liver Function Test in Pregnancy. J. Watson.—p. 85.
Comparison of the Phenolsulphonephthalein Test and the Ambard Index of Urea Excretion. C. Alvarez.—p. 96.

Trachoma in Argentina.—Weskamp relates that 8.7 per cent. had trachoma of the 4,500 eye patients treated at the Hospital Español at Rosario, in the state of Sante Fé, during the years 1921 to 1923. At Buenos Aires the proportion averaged only 4 per cent., while in 1910 the same observer (Demaria) found 10.3 per cent. trachomatous. At Rosario 48 per cent. of those affected had been born in Argentina.

Liver Function Test in the Pregnant.—Watson applied to eleven pregnant women Rosenthal's phenoltetrachlorphthalein test. The response indicated that the liver function was below par after the fifth or sixth month. His impression is favorable to the use of this test to distinguish between a neurotic and a toxic origin for the vomiting of pregnancy, as suggested by Krebs and Dieckmann.

Revista Mexicana de Biologia, Mexico City

5: 361-386 (July) 1925

Syphilitic Origin of Unilateral Dystrophia. Pittaluga.—p. 361.
*Implanting the Sclerotic on the Capsule of Tenon. A. F. Alonso.—p. 369.
Different Types of Histologic Structure in the Nervous System. I. Ochoterena.—p. 374.
Clinical Study of Ascarids. E. Pous Châzaro.—p. 382.

The Sclera Implanted on the Capsule of Tenon.—Alonso clears out the sclerotic coat in enucleating the eye, drawing it inside out like a glove finger, and removing every trace of the uvea. The sclera is rinsed with physiologic solution and is then restored to its normal position inside the capsule of Tenon, to which it is fastened with U sutures and not merely at the edges. The illustrations of the three cases in which he has applied this method sustain his statements that the use of the artificial eye will appear much more natural with this technic.

Revista de la Soc. de Med. Interna, Buenos Aires

6: 73-175 (June) 1925

Ayerza's Disease: the "Black Cardiacs." L. Ayerza.—p. 73.
Etiology of Orthostatic Albuminuria and Glycosuria. Waldorp.—p. 84.
Fistula Between Jejunum and Colon. G. Peco.—p. 123.
*Radiotherapy in Asthma. M. Miranda Gallino and M. Malter Terrada. —p. 132.
*Insulin in Treatment of Hyperthyroidism. F. Puchulu.—p. 140.
*Treatment of Tuberculous Diabetics. Roque A. Izzo.—p. 164.

Radiotherapy of Asthma.—The spleen was irradiated with half the skin dose of penetrating roentgen rays, and 46 per cent. of the twenty-six patients were completely cured; 38 per cent. much improved, and no benefit was apparent in 8 per cent. Two of the patients had such severe attacks of the asthma the day after the first irradiation that they refused to continue the treatment. The asthma was of long standing, from fifteen to twenty-five years in seven and for more than eight years in five, all in the group of complete cures after from one to three exposures. There has been no return of the asthma in the six to fourteen months since. In one case the chest was exposed in addition to the spleen.

Insulin in Treatment of Hyperthyroidism.—Puchulu states that treatment with 5 or 10 units of insulin had a favorable influence on the general condition; the weight increased and the patients became more tranquil, but the vegetative functions, the pulse, the systolic blood pressure, the glycemia, basal metabolism and menstruation did not seem to be influenced by the insulin. In the discussion, Waldorp mentioned a case of exophthalmic goiter with material improvement under insulin treatment.

Insulin in Treatment of Tuberculous Diabetics.—No unfavorable influence on the pulmonary disease could be detected from the insulin in the twenty cases reported.

Sciencia Medica, Rio de Janeiro

3: 389-437 (June 30) 1925

Subarachnoid Injection of Iodized Oil in Diagnosis of Tuberculous Spondylitis. Vampre et al.—p. 393.
*Mechanism of Diuresis Induced by Novasurol. O. de Mello Campos.—p. 414.
Some Nematodes of Arthropods. Lauro Travassos.—p. 416.

Mechanism of the Diuretic Action of Novasurol.—De Mello Campos states that the drug seems to unlock the tissues in dropsy, and thus allow the passage of the excess of water into the blood. This preliminary hydremia precedes the diuresis and explains it. Surprising results have been obtained with novasurol sometimes in cases of dropsy in Libanio's service, all with both heart and kidney derangement. Hydrophilia of the tissues is the special indication for this drug; unfortunately it has the disadvantages of all mercurials for patients with anasarca.

Semana Médica, Buenos Aires

2: 1-56 (July 2) 1925

*Ray Semeiology of the Respiratory Apparatus. A. Viton.—p. 1.
Biologic Bases for Radiotherapy of Cancer. Brachetto-Brian.—p. 25.
*Cure of Tuberculoma of Iris Under Tuberculin. P. Satanowsky.—p. 29.
*Vaccines in Surgery. A. Galindez.—p. 32.

Radiology of the Respiratory Apparatus.—Viton discusses the interpretation of the roentgen-ray findings in different pathologic conditions in the bronchi, lungs, pleura and mediastinum, reproducing seventy-five typical roentgenograms.

Tuberculoma of the Iris Successfully Treated with Tuberculin.—Satanowsky ascribes to the tuberculin treatment the subsidence of a tuberculoma of the iris in a woman of 33. Extremely minute doses were given, twice a week, for a period of five months. In a case of tuberculous iridocyclitis there was a febrile reaction to a dose of tuberculin representing 0.1 c.c. of the twenty zero dilution of the tuberculin, but

the first patient bore this amount without a general reaction, and recovered under progressive treatment, gaining 3 kg. in weight while continuing at work throughout.

Vaccines in Surgery.—Galindez' experience in 100 cases confirms the advantages of preliminary injection of a polyvalent vaccine before operations. He injects 1 c.c. of the vaccine three days before the operation and 2 c.c. the day before. During the year since this has been his practice he has had no instance of pulmonary complications—an unprecedented freedom from postoperative mishaps. His list includes sixty abdominal operations and others for mastitis, leg ulcers, etc., and ambulant affections.

Archiv für klinische Chirurgie, Berlin

136: 627-803 (Aug. 14) 1925

*Hemostatic Effect of Tranfusions. H. Wildegans.—p. 627.
Cerebrospinal Fluid and Cerebral Edema. G. Magnus and W. Jacobi. —p. 652.
Blood Chemistry in Varicose Veins. W. Schaefer.—p. 661.
A Theory on Inflammation. P. Grawitz.—p. 678.
A Case of Perthes' Disease. G. Büttner.—p. 703.
Traumatic Sarcoma of the Bone. J. Sebestyén.—p. 716.
*Hernias of the Semilunar Line. S. L. Koljubakin.—p. 739.
*Calcium Content of Blood and Pus. F. Schulze and E. Scheller.—p. 763.
*The Blood Proteins After Operation. H. Hueck.—p. 774.
Cardiospasm in Cancer of the Cardia. J. Palugyay.—p. 795.

The Hemostatic Effect of Blood Transfusions.—Determination of the coagulation and bleeding time does not yield a satisfactory explanation of the mechanism of hemostasis; but estimation of the thrombin and fibrinogen shows why blood transfusion has a tendency to arrest hemorrhage. This action is observed only if the transfused blood contains thrombin, and if the recipient's blood is deficient in thrombin. The amount of fibrinogen present does not seem to play any appreciable rôle in human pathology. Wildegans reports ten cases in seven of which transfusion had an immediate hemostatic effect; in two cases the effect was only of short duration, and in one case (bleeding from a larger branch of the hepatic vein) no success was obtained.

Hernias in the Semilunar Line.—Koljubakin reports eight cases of these hernias. He found that the protrusions usually occur where the blood vessels pierce the aponeurosis of the transverse abdominal muscle. In the same locations, subperitoneal lipomas are not infrequently found, which may play an important rôle in the pathogenesis of these hernias.

Calcium in Blood and Pus.—Schulze and Scheller found that the blood has regularly a high calcium content in all suppurating diseases, not merely in those cases in which bones are affected. The same is true for the pus. The authors believe that this is one manifestation of the reaction of the organism against the inflammatory process, and that the frequently observed atrophy of the bone in such conditions is caused by a decalcification in order to put the calcium at the wider disposal of the body. The process of final calcification in certain scar formations, consequently, is not a secondary process but one which starts with the very beginning of the inflammation.

Blood Proteins After Operations.—Hueck observed as a general rule that in the postoperative period the blood fibrinogen and the rate of erythrocyte sedimentation are increased, but not necessarily proportionately. The total proteins and the ratio of albumin to globulin are decreased. The surface tension of the serum is not uniformly changed.

Deutsche medizinische Wochenschrift, Leipzig

51: 1347-1386 (Aug. 14) 1925

Endocrine Disturbances in Children. Beumer.—p. 1347.
Urology and Endocrine Disturbances. T. Cohn.—p. 1349.
The Bone Marrow as an Organ. Arneth.—p. 1350.
*Thrombopenic Purpura. E. Leschke.—p. 1352.
Werlhof's Disease. W. Schultz.—p. 1355.
"Of Things Biologic." Schlayer.—p. 1358.
Dysentery in Infants. S. Rosenbaum.—p. 1358.
*Microphotography on the Living Brain. W. Jacobi and G. Magnus.—p. 1362.
Iron Therapy. Stephan.—p. 1365.
Conservative Treatment of Furuncles. W. K. Fränkel.—p. 1366.
*Syphilitic Neuritis. G. D. Koehler.—p. 1366.
Spina Bifida. O. Holzapfel.—p. 1368.
*Diphtheria of Accessory Nasal Sinuses. C. Sonnenschein.—p. 1369.
A Modification of the Inhalation Apparatus. Eppenheim.—p. 1370.
Conductibility of the Heart. E. v. Skramlik.—p. 1371. Conc'n, p. 1408.
Demography of Esthonia. E. Roesle.—p. 1372.

Thrombopenic Purpura.—Leschke introduces various clinical and experimental evidence for the theory that the decrease of thrombocytes cannot explain satisfactorily the pathogenesis of this disease, but that a simultaneous pathologic condition of the capillary endothelium is a coordinated factor. The bleeding time does not always parallel the thrombopenia.

Photomicrography on the Living Brain.—Jacoby and Magnus describe a method by which it is possible to make microscopic studies and to take photomicrograms on the living brain. This method has been applied especially to the study of blood and lymph circulation.

Syphilitic Polyneuritis.—Koehler describes in detail two cases of this rare affection. One of the cases was observed during the late secondary stage, the other in the tertiary stage.

Diphtheria of the Accessory Nasal Sinuses.—Sonnenschein found that diphtheria bacilli not infrequently cause purulent inflammations of the sinuses. A complete cure may be obtained by antitoxin and vaccine treatment, and surgical interference is not necessary.

Deutsche Zeitschrift für Chirurgie, Leipzig

192: 1-347 (July) 1925. Dedicated to W. Müller

Tumors and Cysts of the Mammary Gland. W. Fischer.—p. 1.
Gastric Disturbances and Joint Disease in Toxic Goiter. H. Curschmann.—p. 13.
Sympathectomy in Toxic Goiter. F. Partsch.—p. 28.
Defect in the Tibia Treated with Implant from the Fibula. W. Anschütz. —p. 52.
Fate of Loose Bodies in Joints. J. C. Lehmann.—p. 88.
Thirty-Three Laminectomies. C. H. Lasch.—p. 109.
Treatment of Congenital Luxation of the Hip Joint. Plagemann.—p. 128.
Plastic Operations on Muscles. P. F. Scheel.—p. 136.
Hemorrhages of the Urinary Tract. H. Kümmell.—p. 143.
Surgery of the Bile Ducts. G. Hoseman.—p. 167.
*Large Resections for Peptic Ulcers. M. Friedemann—p. 191.
Perforated Peptic Ulcers. E. Schwarz.—p. 239.
Surgical Treatment of Gastroptosis and Gastritis. Elter.—p. 266.
Invagination in Childhood. A. Becker.—p. 275.
Vicious Circle; Hard Gastric Ulcer. Eggers.—p. 281.
The Treatment of Bile Fistulas. Braeunig.—p. 283.
Simplified Operations for Hernias. E. Moser.—p. 298.
Some Unusual Cases of Echinococcus Infection. O. Langemak.—p. 307.
*Blood Platelets in Surgical Disease. H. Hueck.—p. 322.
The Blood Indican in Renal Insufficiency. E. Eick.—p. 330.
Katzenstein's Functional Test for the Heart. F. Emmerich.—p. 337.
A Simple Help in Asphyxia During Anesthesia. Becker.—p. 345.

Treatment of Peptic Ulcers.—Friedemann advocates in severe cases of peptic ulcers a radical operation, namely, the removal of that part of the stomach or duodenum which contains the ulcer, including the pylorus and antrum, and to close the stomach by the Billroth I or II method. He found that such radical resections influence the chemistry of the stomach very favorably, and give good and permanent results. In 536 operations he had a mortality of 5.5 per cent. as compared with 14.4 per cent. in nonradical operations; 94.2 per cent. of the patients were free from symptoms after three years, as compared to 68.4 per cent. of the gastroenterostomy patients.

The Blood Platelets in Surgical Maladies.—Hueck concludes from counts of the platelets in 100 cases that this method does not play a significant rôle in surgical diagnosis. In the first five days after operation a decrease is usually found; then a rise is noticed beyond the normal by the eighth to the eleventh day, and after this a slow return to normal values.

192: 349-419 (Aug.) 1925

*The Value of Intraspinal Anesthesia. H. Grumach.—p. 349.
Anesthesia by Rectum. I. von Török.—p. 366.
Neurofibromatosis and Sarcoma. H. Feriz.—p. 372.
*Xanthomatous Giant Cell Tumors. O. Wustmann.—p. 381.
Free Fat Transplantation into the Skull. W. Stemmler.—p. 401.
*Bone Formation in Dura Endotheliomas. A. Weiser.—p. 405.

The Value of Intraspinal Anesthesia.—In five hundred cases of spinal anesthesia only 1 per cent. of failures was observed, and not a single serious ill effect. Grumach emphasizes the importance of proper technic and indications.

Xanthomatous Giant Cell Tumors.—Wustmann believes that these pathologic products are not true tumors, and certainly not true sarcomas. They are formed to accumulate the excess of cholesterol in these patients. Xanthomatous new growths are strictly dependent on the cholesterol diathesis. They practically never metastasize, and their growth is not infiltrative and destructive.

Bone Formation in Endotheliomas of the Dura.—It is well known that in a considerable percentage of endotheliomas, hyperostoses of the skull are found opposite the tumor. Weiser reports two cases where he found true bone formation on the cerebral surface of endotheliomas. He believes that this occurrence has never been described in the literature before.

Klinische Wochenschrift, Berlin

4: 1625-1672 (Aug. 20) 1925

Vegetative Nerve System and Infections. F. Glaser.—p. 1625.
*Meningeal Permeability in Schizophrenia. A. Hauptmann.—p. 1629.
Serodiagnosis of Syphilis. H. Sachs.—p. 1630.
Three Cases of Duodenal Stenosis. G. Kelling.—p. 1633.
*Experimental Achylia. K. Glaessner.—p. 1635.
Estimation of Sodium Thiosulphate in the Urine. Holbøll.—p. 1636.
On Breathing Sounds. Alfons Winkler.—p. 1640.
Pharmacologic Influences on the Blood Vessels of the Skin. L. Török and E. Rajka.—p. 1642.
Side Effects in Radiothorium. K. Lessheim.—p. 1645.
Why Does the Tongue Not Feel the Arterial Pulse? T. Hausmann.—p. 1645.
The Arndt-Schulz Rule. Mayer.—p. 1649. Comment. Handovsky.—p. 1650.
Studies on Cholesterol. R. Stern.—p. 1650.
Female Sexual Lipoid in Birds' Eggs and Fish Ovaries. Fellner.—p. 1651.
A Survey on Bronchial Asthma. A. Jaeger.—p. 1652.

Decreased Meningeal Permeability in Schizophrenia.—Hauptmann examined the meningeal permeability in different psychopathic patients, using as test object bromin. Out of twenty-four patients with schizophrenia, seventeen showed a considerable decrease of permeability; in six the values were within the normal range, and one had an increased value. The author believes that this decreased permeability, which he never found in patients with manic-depressive insanity, indicates a disturbance in the nourishment supply of the central nervous system.

Induced Decrease of Gastric Secretion.—Glaessner found that fever, artificially induced by injections of nuclein and similar substances, does not noticeably affect the gastric secretion. Certain vaccines, however, especially typhoid vaccine and tuberculin, decrease the amount of the gastric secretion, its hydrochloric acid and pepsin considerably, and over a period of several weeks.

Medizinische Klinik, Berlin

21: 1219-1254 (Aug. 14) 1925

A Survey on Leukemia. Wilhelm.—p. 1219.
Intracutaneous Reactions with Tuberculin and Nonspecific Proteins. F. Schmid and E. Weidinger.—p. 1223.
Insulin in Diabetes. H. von Gündell.—p. 1226.
A Case of Agranulocytosis. W. David.—p. 1229.
Burns. P. K. Schreiner.—p. 1231. Conc'n.
Linser's Treatment for Syphilis. L. Benedek and E. v. Thurzó.—p. 1234.
The Frequency of Bronchial Cancer. H. Holzer.—p. 1235.
*Experiments on Glycolysis. A. Loeser.—p. 1237.
*Group-Specific Hemo-Opsonins. F. Schiff.—p. 1238.
Post Partum Care. F. Eberhart.—p. 1240. Cont'd.
Recent Literature on Ophthalmology. Adam.—p. 1241.
Recent Urologic Literature. R. Paschkis.—p. 1242.

Glycolysis of Vaginal Tissue.—Loeser examined on explanted vaginal mucosa the glycolytic action of this tissue, using the method that Warburg evolved in his well known cancer studies. He found that living vaginal mucosa splits glucose into lactic acid, and that this process is the more active the healthier and constitutionally stronger the individual from which the excision was made.

Hemo-Opsonins.—Serum substances which stimulate phagocytosis of the erythrocytes of the same species were first demonstrated by Hektoen. Schiff studied these "isohemo-opsonins" in their relation to the iso-agglutinins, and found that they are divided into the same four blood groups. Their occurrence is not far as frequent as that of the agglutinins, but whenever they are present in a serum they always act exclusively on the same groups of red cells as do the agglutinins of this serum.

Monatsschrift für Geb. und Gynäkologie, Berlin

70: 121-242 (Aug.) 1925

The Value of Research in Constitutional Problems. F. Kirstein.—p. 121.
The Shifting of Edemas in Pregnancy. R. Bund.—p. 132.
*The Visual Field in Pregnant Women. E. L. Metzger et al.—p. 140.
Uterine Retroflexion and Childbirth. H. Katz.—p. 147.
Pregnancy in an Accessory Uterine Horn. L. A. Kriwsky.—p. 159.
Childbirth with Placenta Praevia without Hemorrhage. B. Liegner.—p. 169.
*Philipp's Virulence Test in Puerperium. P. Thadewald.—p. 174.
Sedimentation and Agglutination Tests. Mandelstamm.—p. 180.
Mortality in the Puerperium. H. Wüsthoff.—p. 189.
Sacral Teratomas. A. Hedfeld.—p. 194.
Delivery of a Thoracopagus. R. Lamy.—p. 199.
A Congenital Scalp Defect. K. Burger.—p. 201.
Carcinoma and Tuberculosis of the Uterus. G. Hirsch.—p. 204.

The Field of Vision in Pregnant Women.—Metzger, Simon and Weinberg examined the visual field in fifty-six pregnant women and found in no case a narrowing which could be referred to any anatomic lesion. But they detected quite regularly functional deviations from the normal, such as are frequently found in neurasthenic or hysteric persons.

Virulence Test in Puerperal Sepsis.—Thadewald reports very encouraging results with Philipp's virulence test in puerperal sepsis.

Monatsschrift für Kinderheilkunde, Leipzig

30: 385-496 (Aug.) 1925

An Epidemic of Chickenpox. J. Heuberger.—p. 385.
*Clinical Studies of Vaccination. W. Kuhle.—p. 390.
Iodin in Substernal Goiters. G. Petényi.—p. 419.
*Avitaminosis in Breast-Fed Infants. G. Petényi.—p. 422.
Salaam Convulsions. H. Knauer.—p. 428.
The Facialis Phenomenon in Children. W. Falk.—p. 434.
*The Bone Marrow in Infants. Kramár and Hensch.—p. 440.
The Technic of the Cathodal Closing Reaction. Freise and Schimmelpfeng.—p. 450.
Situs Inversus in a Female Infant Cadaver. G. Borchers.—p. 460.
*Twins with Congenital Syphilis. O. Herz.—p. 467.

Subcutaneous Vaccination.—The subcutaneous injection of a dilution of 1:200 of vaccine produces the same immunity as cutaneous vaccination; the incubation period is the same in both methods, and it is a few days longer in intracutaneous vaccination. Kuhle advocates the subcutaneous technic in cases where scar formation must be avoided, and when vaccination is imperative in patients with skin diseases.

Avitaminosis in Breast-Fed Children.—Petényi believes that breast-fed children may develop avitaminotic conditions, such as retardation of development in general and mild forms of anemia. This is due to the deficiency of the vitamin D in the milk. The addition of a small amount of vegetable to the food is very effective.

The Cytology of the Bone Marrow in Infants.—Smears from the bone marrow show on an average 61 per cent. of myeloid cells and 25 per cent. lymphocytes; the former group consists of promyelocytes, myelocytes and leukocytes, predominantly young types. Less than 1 per cent. basophil leukocytes, and 1-3 per cent. eosinophil leukocytes are found. There are about 5-10 nucleated red cells to each hundred white cells; but in syphilis and rickets their number is much increased (to 47 per cent. and 20 per cent., respectively). In infants with exudative diathesis one finds frequently a considerable eosinophilia (8-9 per cent.) even if the blood eosinophils are not increased in number. Rickets and whooping cough induce lymphocytosis in the bone marrow. Kramár and Hensch believe that diagnostic puncture of the bone marrow does not involve any danger, if done properly.

Congenital Syphilis in Nonidentical Twins.—Herz reports the history of a girl 3 weeks of age with the typical symptoms of congenital syphilis and a four plus Wassermann reaction. She died seven days after admission to the hospital. Her twin brother died more than three months later of bronchopneumonia and empyema. He never showed any symptoms of syphilis, his Wassermann was always negative; the necropsy and the histologic examinations did not reveal any signs of syphilis.

Wiener klinische Wochenschrift, Vienna

38: 903-926 (Aug. 13) 1925

The Symptomatology of Tabes. H. Hoff and P. Schilder.—p. 903.
*Pancreatic Tissue in an Intestinal Diverticulum. W. Steiger.—p. 909.
Treatment of Gonorrhea. K. Skutezky.—p. 910.
*Cautery Treatment in Conjunctivitis. A. Maria Rosenstein.—p. 912.
Appetite. R. E. Mark and R. J. Wagner.—p. 913.
A Functional Liver Test. R. Bauer.—p. 913.
The Dosage of Sexual Hormones. O. Kauders.—p. 913. Conc'n.
A Viennese Medical Society in the Beginning of the Nineteenth Century. I. Fischer.—p. 915. Conc'n, p. 940.

An Accessory Pancreas in the Ileum.—Steiger reports the case of a man, 20 years of age, in whom an accessory pancreas in a diverticulum of the lower ileum caused a subacute invagination of the intestine.

Galvanocautery in the Treatment of Conjunctivitis.—Rosenstein recommends this treatment for all the various forms of chronic conjunctivitis. She reports very satisfactory results in more than 550 patients whom she has treated during a period of five years.

Zeitschrift für Tuberkulose, Leipzig

42: 529-626 (July) 1925

*The Outcome of Treatment for Tuberculosis. Liebermeister et al.—p. 531.

Estimation of the Outcome of the Standard Course of Sanatorium Treatment for Tuberculosis.—Liebermeister discusses this subject from the medical standpoint; Legat from the standpoint of the sickness insurance societies, and Wölz from the standpoint of general welfare work and sociology. These were addresses delivered at the recent annual meeting of the German Zentralkomitee zur Bekämpfung der Tuberkulose. The transactions are given in full, but the others were mostly of local administrative interest.

43: 89-168 (Aug.) 1925

Epidemiology of Childhood Tuberculosis. F. Redeker.—p. 89.
*Antibodies After Tuberculin Treatment. T. Gruschka and E. Guth.—p. 103.
Vertebral Ankylosis with Pulmonary Tuberculosis. Siegfried.—p. 109.
Nonacid-Fast Tubercle Bacilli. IV. R. Arima et al.—p. 112.
Blood Sugar in Pulmonary Tuberculosis. W. Landau and O. Glogauer.—p. 121.
The Contagious Tuberculous Patient. Kayser-Petersen.—p. 128.
*Pulmonary Tuberculosis in Jews. I. Werner.—p. 130.

Antibodies After Tuberculin Administration.—Gruschka and Guth found that the injection of tuberculin in small amounts is followed by the production of complement fixing antibodies in active tuberculous patients. Nontuberculous persons do not develop these antibodies even after considerable amounts of old tuberculin.

Pulmonary Tuberculosis in the Jew.—Werner analyzed the course of the disease in 225 patients. He found that the disease tended to severer forms in the postwar period (in Berlin) than before the war; but still he believes that, compared with other statistics, pulmonary tuberculosis takes a milder course in the Jewish patient than in the Gentile.

Zentralblatt für Chirurgie, Leipzig

52: 1809-1872 (Aug. 15) 1925

Case of Retrograde Incarceration of the Testis. H. Kunz.—p. 1810.
*Periarterial Sympathectomy. G. Monaschkin.—p. 1812.
A Case of Palpable Air Embolism. J. Vigyázó.—p. 1816.
Plaster as Filling Material. S. Kofmann.—p. 1817.

52: 1873-1936 (Aug. 22) 1925

Dilating the Anus. M. Kirschner.—p. 1874.
Dietetics After Gastro-Enterostomy. A. Jarotzky.—p. 1876.
Osteofibroma of the Femur Neck. Sonntag.—p. 1880.
Stones in the Renal Pelvis. N. Beresnegowsky.—p. 1882.
Pharyngeal Tube in General Anesthesia. H. Schmidt.—p. 1884.
Treatment of Intestinal Fistula. Ahrens.—p. 1886.
Postoperative Acidosis. M. Herz.—p. 1889.

Periarterial Sympathectomy.—Monaschkin made histologic studies on three patients who had been operated on on account of spontaneous gangrene. The fact that the vasa vasorum are removed or severed by the operation may entail necrosis of the arterial wall. The operation may lead to a sclerotic scar which constricts the artery. It is therefore important to surround the decorticated artery with fat tissue.

Zentralblatt für Gynäkologie, Leipzig

49: 1841-1888 (Aug. 15) 1925

Anatomic Proportions in the New-Born. A. Seitz.—p. 1842.
*Roentgentherapy in Gynecology. W. Framm and A. Wierig.—p. 1847.
Implantation of Tubes in Uterus. K. Volkmann.—p. 1851.
Rupture of Symphysis in Spontaneous Delivery. S. Polgár.—p. 1855.
Antefixation of Retroflexed Uterus. W. Sigwart.—p. 1859.
Transverse Position in Frontal Presentation. P. v. Kubinyi.—p. 1860.
"Induced Premature Delivery with Narrow Pelvis." P. Kühnel.—p. 1865.

Roentgen-Ray Treatment of Inflammatory Diseases of the Pelvic Organs.—Framm and Wierig treated thirty-five women with acute and chronic inflammatory processes in the adnexa or the parametrium with roentgen rays, and obtained seven complete cures, twenty-two improvements; five women were unimproved, and one patient became worse under the treatment. The dosage used was always far below the sterilizing amount of rays.

49: 1889-1936 (Aug. 22) 1925

Peristalsis of Fallopian Tubes. R. Dyroff.—p. 1890.
*Treatment of Incipient Mastitis. W. Schmidt.—p. 1893.
An Unusual Case of Criminal Abortion. G. Raestrup.—p. 1896.
Leukorrhea and Constitution. A. Loeser.—p. 1898.
Legalization of Abortion. M. Hirsch.—p. 1901.
Eclampsia without Convulsions. S. Liebmann.—p. 1906.
Operative Interposition of the Uterus. A. Werner.—p. 1910.

Treatment of Incipient Mastitis.—Schmidt withdraws in such cases 20-50 c.c. of blood from the patient, and injects it immediately at the site of the inflammation. He treated a few patients by this method, and believes that it is possible in this way to prevent abscess formation.

Zentralblatt für innere Medizin, Leipzig

46: 785-816 (Aug. 22) 1925

Diabetic Coma in Adolescent; Rapid Recovery. E. Lang and P. Mahler.—p. 786.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

2: 569-696 (Aug. 1) 1925

Annals of Human Credulity: Abrams' Electronic Reaction. G. van Rijnberk.—p. 570.
*Immunization Against Cancer. N. Waterman.—p. 577.
*Thrombosis in Mesenteric Veins. P. R. Michaël.—p. 584.
Pneumothorax for Unilateral Tuberculosis. Marsman and Backer.—p. 589.
Melanin and Hematophorphyrin in Urine. H. H. van der Zoo de Jong.—p. 598.
Gye and Barnard's Research on Cancer. H. T. Deelman.—p. 600.
Dysentery at Nijmegen in 1736. E. D. Baumann.—p. 605.
*Goiter in Classic Art. E. C. van Leersum.—p. 620.
Health Board of the League of Nations. N. M. J. Jitta.—p. 657.

Immunization Against Cancer.—Waterman's further research has confirmed his assertions last year in regard to a heat-stable substance in the extracts of benign tumor filtrates which activates glycolysis without having a direct ferment action itself. It proved possible by preliminary treatment with extracts of benign tumors to make mice refractory to inoculation of malignant tumor substance. It is not a true immunizing process, but merely a modification of the hormonal system, as is evident in the changes in the sugar content of the blood and in glycolysis. A similar inhibiting influence is apparent also with injection of insulin. He urges that this nonspecific inoculation should be applied as an adjuvant in treatment of human cancers, especially in prophylaxis of recurrence.

Thrombosis of Mesenteric Veins.—Michael operated promptly, removing 3 meters of the small intestine with the edematous mesentery and thrombosed vessels. The sudden intense pain around the navel, with paroxysmal recurrence, had been preceded by a month of occasional vomiting, and anemia, with hemoglobin 38 per cent. A month after the operation the spleen enlarged and thrombosis became evident in the femoral vein, but this all subsided harmlessly, and the young woman left the hospital in good condition. A miscarriage four months before may have been responsible for the whole process.

Enlargement of the Thyroid in Art.—Ten reproductions are given of paintings of Madonnas by the old Dutch, German or Italian masters, and van Leersum gives a list of others in all of which the neck shows more or less thyroid enlargement. He calls attention further to the prominent Adam's apple in certain female figures in painting and sculpture.

He remarks that some of them would not be out of place in a textbook on pathology. He adds that the extremely high forehead or long fingers in certain works of art may be regarded as simply a question of the artist's taste, but the number of paintings from the fifteenth and sixteenth centuries showing enlargement of the thyroid testifies that this was common in that age. This demonstrates that the incidence of goiter cannot be explained by any factor which has come into play only in the last century or two.

2: 697-796 (Aug. 8) 1925

Suicide or Murder? J. P. L. Hulst.—p. 698.
*Examination of the Blood. W. Schüffner and Ruys.—p. 710.
*The Concentration Trend in Evolution. W. A. Mijsberg.—p. 719.

Minor Points in Examination of the Blood.—Schüffner and Ruys point out that the leukocytes retain their shape if the specimen of blood is allowed to dry slowly, of itself, without waving in the air. They also warn that there is a peripheral monocytosis which may prove misleading. The count in blood from the ear varies widely according as the ear is pale and cool or has been well reddened by friction.

Concentration as a Phenomenon of Evolution.—Mijsberg carries still farther Bronn's conception of the seven evolutionary processes, culmination, differentiation, concentration, centralization, interning of the vital organs, and increase in the size of the body, with reduction in the number of similar organs. He illustrates his views in particular with the comparative anatomy of the vascular system, the evolution from the multiple and scattered to the simple and concentrated.

Acta Medica Scandinavica, Stockholm

62: 197-377 (Aug. 13) 1925

A Danish Disease Resembling Tropical Sprue. T. E. Hess Thaysen.—p. 197.
Blood Sugar Curves in Diabetics After Glucose and Insulin Injections. K. M. Hansen and H. Rønlund.—p. 213.
Ignorance of the Existence of Disease (Anosognosia) in Cerebral Hemiplegia. A. Barkman.—p. 235.
*Essential Thrombopenia. G. Höglund.—p. 255.
Value of Blood Sugar Determinations in Glycosuria. H. Malmros.—p. 294.
*Fistulas into Esophagus. Westergren and Ragnell.—p. 319.
Insulin in an Oil Emulsion. E. Hedvall.—p. 334.
Ossification of Auricles of Both Ears. G. Ekehorn.—p. 351.
Daily Blood Sugar Variations in Diabetics. A. Flaum.—p. 372.

Essential Thrombopenia.—Höglund recapitulates all the various theories on the pathogenesis of this disease, and gives a complete survey of the literature on the subject. He reports three cases of his own *in extenso*, and formulates the indications for the treatment as follows: In mild cases, conservative treatment and the administration of hemostyptics should be tried first. If no improvement is obtained, roentgen-ray treatment of the spleen should be given. In severe cases, or when any other treatment proves unsuccessful, removal of the spleen is indicated, and this achieves usually a prompt arrest of the hemorrhagic diathesis.

Two Cases of Broncho-Esophageal Fistula.—Westergren and Ragnell found in one case a fistula connecting the esophagus with the two main bronchi, which was formed by the breaking down of a tuberculous mediastinal lymph gland. In the other case, an esophageal diverticulum had perforated into the right lower lobe, where extensive gangrenous processes were found.

Norsk Magazin for Lægevidenskaben, Oslo

86: 757-916 (Aug.) 1925

*Permeability of the Meninges. O. Jervell.—p. 757.
*Coxa Plana. S. Widerøe.—p. 811.
*Treatment of Pituitary Tumor. Zeiner-Henriksen.—p. 818.
Paresthetic Meralgia. Zeiner-Henriksen.—p. 820.
*Rupture of Uterus After Cesarean Section. G. Schaanning.—p. 824.
Statistical Study of Appendicitis. N. Paus.—p. 861.
Treatment of Gastric Ulcer. N. Paus.—p. 872.
Recent Literature on Iodin Treatment of Primary Exophthalmic Goiter. J. Nicolaysen.—p. 880.

Passage of a Stain into the Cerebrospinal Fluid.—Jervell tabulates the details of seventy-six cases in which the lumbar puncture fluid was examined after ingestion of uranin. If the fluid does not show the stain three hours after 2 gm. of uranin has been taken by the mouth or injected intramuscularly in a 20 per cent. solution, then meningitis can be excluded. A pronounced change of tint indicates extensive meningitis but not its form. Uranin does not pass into the saliva, tears or other secretions but stains the tissues readily and passes into exudates. This suggests that the spinal fluid in meningitis is more of the nature of an exudate than a secretion. No trace of the stain in the spinal fluid was left by the eighteenth hour. He adds that it might be interesting to determine whether intravenous injection of solutions of various other substances in different concentrations might modify the permeability of the meninges for the stain, and thus for drugs.

Coxa Plana.—Widerøe gives a three-year series of roentgenograms of a case of the Calvé-Legg-Perthes hip joint affection. They show clearly a phase of destruction for about a year and a half, and then two years of reconstruction.

Pituitary Tumor Improved by Pituitary Treatment.—Amenorrhea in 1918 and progressive impairment of vision in 1921 were soon followed by an epileptiform attack once a month, with loss of consciousness. The woman had three healthy children. In 1923 the sella turcica and the urine seemed to be still normal. Treatment was then begun with potassium iodid and thyroid and pituitary extracts. Menstruation promptly returned and there were no further epileptiform seizures. The single seizure each month seemed to be a kind of vicarious menstrual manifestation, and the return of the menses twenty-four hours after the first dose of pituitary extract seems to indicate some toxic connection between the pituitary and the menstrual process. During the two years since 1923 the woman has had a few very mild returns of the seizures and two severe ones. Radiotherapy for the assumed pituitary tumor was contemplated but not attempted.

Rupture After Cesarean Section.—Schaanning compares the literature with his own experience in 88 cases of cesarean section since 1908. There was no instance of rupture or other complication of childbirth later in the group of 28 vaginal cesarean sections or in the 18 cervical, but there was one case of rupture in the 42 classic corpus cases. Only 39 of the total 88 have been known to pass through a pregnancy since, but some have borne up to three children.

Ugeskrift for Læger, Copenhagen

87: 685-708 (Aug. 6) 1925

*The Reaction to Sanocrysin. J. Frandsen.—p. 685.
*Test for Gold in Organic Substances. S. Lomholt.—p. 686.
*Experiences with Sanocrysin. H. Poindecker.—p. 687.
*Idem. G. E. Permin et al.—p. 695.

The Long Febrile Reaction to Sanocrysin Treatment.—Frandsen theorizes to explain the rise in temperature which persists for a week or two in 75 per cent. of the tuberculous under sanocrysin treatment at first.

Determination of Small Amounts of Gold in Organic Substances.—Lomholt describes an electrolytic method worked out for study of the distribution of sanocrysin in the tissues.

Experiences with Sanocrysin.—Poindecker reports that the tubercle bacilli did not disappear completely from the sputum in any of the fifteen tuberculous patients treated at Vienna, although improvement was marked on the whole. Permin relates that of his sixty-seven patients treated more or less systematically with sanocrysin, fourteen showed such improvement, disappearance of bacilli and roentgen shadows, that he thinks the treatment must be credited with it, as these favorable changes occurred notwithstanding the characteristic loss in weight, general depression and bowel disturbances which conflict with all the generally accepted principles of sanatorium treatment.

87: 725-750 (Aug. 20) 1925

*Sanocrysin Treatment of Tuberculosis. H. Hansborg.—p. 725.
Volkmann's Ischemic Paralysis. E. Jensen.—p. 729. Cont'd.
Retropharyngeal Phlegmons. G. V. T. Borries.—p. 734.
Glucose in Spinal Fluid. C. J. Munch-Petersen.—p. 738.
Nocturnal Enuresis. C. Gram.—p. 739.

Elimination of Gold During Sanocrysin Treatment.—Hansborg relates that iodometric titration has demonstrated that the gold loses at once its easily diffusible character in sanocrysin treatment, and behaves like other heavy metals. It is still detectable in urine and stools over eight months later.